AMERICAN JOURNAL of VETERINARY MEDICINE

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PUBLISHED MONTHLY. CHICAGO, U. S. A.

VOL. XIII OCTOBER, 1918 No. 10

Infectious Abortion and Its Complications as a Cause of Sterility

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THERE is no problem of animal diseases that concerns the veterinarian and the breeder of cattle to the same extent as does this problem of abortion and sterility. The preparation of this article is undertaken with the hope that it will provide some information on this problem. It is hoped that the practicing veterinarian will find it an aid to him in his cattle practice, and that the breeder will not only find in it much information that may be applied by himself, but that it will enable him to more highly value and weigh the services of a properly qualified veterinarian. At the end of this article will be found a few simple suggestions which we believe are entirely practicable on most farms and if applied effectively and persistently will greatly reduce the losses from abortion and sterility and at the same time reduce the losses from disease of newborn calves.

Much progress is being made in handling the condition under discussion and there is sufficient knowledge available, if applied, to greatly reduce the losses.

There is no other disease for the control of which the local veterinarian is so unprepared as is the one under discussion. I say the local veterinarian, for upon him, and justly so, must fall the responsibility of controlling this condition. The professional inability of the local veterinarian to meet this responsibility is no fault of his.

There are two good reasons why this is true. First, the local veterinarian has had no opportunity to qualify himself to handle diseases of the reproductive organs, because sufficient attention has not been given them in veterinary colleges; and second, the farmer has not, and does not now, know the importance of a qualified professional and constant veterinary supervision in the control of this condition. Consequently, sufficient inducement has not been given the local veterinarian to attain the necessary knowledge and experience.

It is admitted that there are a few exceptions to the above statements. There are a few local veterinarians who are capable of meeting the situation and there are a few farmers who know that these conditions cannot be controlled without the aid of a qualified veterinarian, but the general statement is true.

There are some who claim that the treatment of this condition should be left to specialists who are devoting their entire time to this work. There are two reasons why this cannot be done. First, the specialist from a distance cannot go

to the farm as quickly and as frequently as most of the cases require; and, second, the cost to the breeder would necessarily be so great that professional service would not always be secured when needed.

No claim is made for completeness of the material presented. The works of Sven Wall, Stockholm, Sweden; J. Albrechtsen, Copenhagen, Denmark; Professor W. L. Williams, Ithaca, New York, and others have been drawn upon, to whom grateful acknowledgment is given.

It is necessary to refer briefly to the histology of the reproductive organs, first, in order to appreciate their delicate structure and to understand the physiology of reproduction, and second, to understand the changes resulting from disease and the limitation of medicinal agents in the treatment of diseases of them. It is not the purpose to go into detail as to their histological structures, but only those phases that are considered to have a practical application will be discussed.

The uterus, oviducts, and vagina are developed from two mesodermal tubes known as Müllers tubes. The posterior part of these tubes converge and unite to form the body of the uterus, cervix and most of the vagina.

At first the mucosa of the uterus, cervix and vagina are covered with a simple epithelium derived from the mesoderm; later in the development of the fetus the stratified epithelium of the ectoderm grows in, so to speak, replacing the simple columnar epithelium derived from the mesoderm. It is believed that this is the process which occurs and not that the simple columnar epithelium covering the vagina develops into a stratified epithelium.

Usually in a newborn calf the stratified epithelium extends to within one-half to one inch of the external os uteri or may extend to the external os uteri. As the animal grows older the stratified epithelium may extend one or more inches into the cervical canal. It is believed that in many cases the stratified epithelium grows at the expense of the simple columnar and that parturition favors this growth. Certain diseases of the cervix and uterus may result in this ectodermoisering. This is accounted for by the greater regenerative capacity of the stratified epithelium of the ectoderm. The mucosa of the cervix is glandless and it forms several folds at the external os. These folds arranged circularly form a rounded prominence which projects into the cavity of the vagina. The characteristic mucus of pregnancy which seals the cervical canal is derived from specialized cells found within the mucosa of the cervix.

The mucous membrane lining the uterus is from one-twenty-fifth to one-twelfth inch thick in a virgin or gravid uterus. It shows two distinct layers, an inner cellular one about one-fiftieth inch in diameter, an outer thicker layer which is more fibrous and less cellular and contains the uterine glands and the blood vessels. There is no sub-mucosa. The mucous membrane is differentiated into two parts, namely the cotyledons and the gland mucosa. The uterine cotyledons number about one hundred and contain no glands. However, they are separated from the muscle coat by a layer of uterine glands which open at their side and not on their surface. The cotyledons in the non-gravid uterus average about one-eighth to one-fourth inch in length and a little less in width and thickness. During pregnancy they become much larger and pedunculated. The larger ones may reach a length of three and one-half to four inches, three inches in width, two and one-half inches thick. The cotyledons are covered by a simple columnar epithelium and in the latter stages of pregnancy show about sixty crypts per square inch, an inch or more in depth and about three-tenths millimeters wide at the surface and one-tenth millimeter wide at the bottom. The walls of the crypts consist of fine connective tissue fibers covered by a simple cubical epithelium. The walls form numerous branched niches. These crypts receive the chorionic villi, a villus for each crypt which branches like a tree and extends into the niches of the crypt. After parturition the cotyledons undergo a series of

changes known as involution. A great reduction of volumn takes place so that in about three days they are about one-tenth as large as in the last month of pregnancy. This reduction is not a result of muscular contraction as there are no muscles except in the walls of the vessels. Neither does it contain much elastic tissue. The reduction is probably the result of the contraction of the fibrous tissue of the wall after the detachment of the chorionic villus. A waxy degeneration with necrobiosis in the cells can be observed in the connective tissue stroma. The mucous membrane between the cotyledons differs from that of the cotyledons in its richness of glands and may be called a gland mucosa. In the virgin uterus, according to Sven Wall, there are from thirty-six hundred to forty-two hundred cross-cut tubuli per square inch of surface, they have an average diameter of seventeen microns. In the gravid uterus there are from six to nine hundred cross-cut tubuli per square inch with a diameter of about fifty microns. These figures show that the uterine glands grow very wide during pregnancy. The muscular coat of the uterus plays a lesser part in its diseases. The thickness of the muscular coat varies from three to twelve millimeters. The thickness of the walls in the gravid uterus is somewhat less than in the non-gravid.

The oviducts are long and tortuous and are so nearly closed that it is almost impossible to pass a probe through them, in fact their condition is such that it is practically impossible in douching the uterus under pressure to force any solution through them.

The ovaries are from one to one and one-half inches in length and frequently as much as one inch in thickness. They are oval in form. There is considerable variation in the size of the ovaries. They are covered with a layer of germinal epithelium. Graaffian follicles of various sizes and corpora lutea are often seen projecting above the surface.

Physiology

The cow ordinarily takes the bull from six weeks to two months after calving. It is said that ovulation usually follows a few hours after signs of estrum, however ovulation may occur without estrum and estrum may occur without ovulation. At the time of ovulation there is a rupture of a graafian follicle and an ovum is discharged. The rupture of the follicle is thought to be due to an increased vascular congestion of the ovary. The tension of the ovary is increased, forcing the follicle to the surface, the circulation at the most projecting point is interfered with to such an extent as to cause necrosis at which point the rupture takes place. After the follicle bursts its wall collapses. It receives some blood from the ruptured vessels, later it is filled with cells containing yellow pigment. The vesicle at this stage is known as a corpus luteum. It is normally five-eighths to three-fourths inches in diameter, slightly oval, with a firm consistency.

Just how the dislodged ovum enters the oviduct is a question. Some believe that at the time of ovulation the fimbriated end of the oviduct grasps the ovary and receives the ovum. This is questionable since there is good evidence that the dislodged ovum does not necessarily reach the uterus through the tube of the same side. It has been demonstrated by experiments that the ovary of one side may be removed and the horn of the opposite side and still conception be possible. It has been observed that in pregnancy the corpus luteum of pregnancy is in the opposite ovary from that of the pregnant horn.

The fate of the corpus luteum in the ovary is determined by whether conception occurs or otherwise. If the animal is not bred or conception does not result from service the corpus luteum will have almost completely disappeared by the eighteenth to twentieth day. This has been spoken of as the false corpus luteum. In some cases, however, the false corpus luteum persists. This will be referred to later. However, if conception occurs the corpus luteum persists one or two months after parturition. There is no apparent difference either in size or histological structure between the false corpus luteum and the corpus luteum of pregnancy.

Usually within one or two days after ovulation there are signs of menstruation. There may be observed a sanious discharge from the vulva adhering to the tail and adjacent parts. If the cow was bred and conceived this is not usually observed. In certain diseases of the uterus the menstrual flow is increased in volume. At the time of menstruation there is hyperemia of the reproductive organs, increased mucus, with more or less hemorrhage, a condition which is apparently favorable to infection of the uterus at this time.

After fertilization of the ovum nutritive elements are essential; it is probable that nutrition of the fertilized ovum during the pre-placental period is derived from the uterine milk. This is a white or rosy white fluid of creamy consistency containing protein, fat and ash. This is apparently a secretion of the uterine glands and is probably involved in the nutrition of the fetus throughout the entire period of fetal life. It will be pointed out later that the changes in the uterine mucosa, resulting from infection, and interfering with the physiological function of the glands of the uterus are probably a cause of many cases of sterility.

It is desirable that the practitioner who is to become skilled in the treatment of sterility be able to determine with a reasonable degree of accuracy the condition of pregnancy within a short time after conception. With this fact in mind brief consideration of the clinical evidence of pregnancy will be given.

According to DeBruin, the embryonic period consists in that stage of development until the fetal circulation is complete and is said to extend to about the twenty-eighth day. At the end of this time the fetus is about two-fifths inch in length and the first signs of the extremities appear. During the second month the extremities develop. At the end of this period you notice at the end of each extremity a little colorless conical elevation. This is the first indication of a hoof. Now the fetus is two to two and a half inches in length. At the end of the third month the fetus is about five and one-half inches long. The scrotum appears. About this time the hoof becomes distinct. At the end of the fourth month the fetus is about nine and one-half inches long. Shortly after this the first tactile hairs appear on the lip, chin and upper eyelid. During the fifth month the teats of the female are visible; in the male the testicles descend into the scrotum. At the end of the fifth month the fetus measures about fourteen inches. During the sixth month the body is still naked except the lips and eyelashes. At the end of the sixth month the fetus has reached a length of about eighteen inches. At the end of the seventh month a few long hairs are observed at the end of the tail, around the coronet and the crest of the head. At this time the fetus measures about two feet. During the eighth month the back begins to be covered with hair and at the end of this time the fetus measures about two and one-half feet. During the ninth month the body becomes fully covered with hair and the fetus reaches a length of two and one-half to three and one-half feet. It should be stated that there is considerable variation in the measurements given in different individuals and different breeds and the figures are only approximately correct.

The evidences of pregnancy are the cessation of estrum and changes in the uterus including asymetry of the horns, the nature of the walls, the presence of a fluctuating fluid in the uterus, and changes in the external os and cervical canal. In a cow that has come in heat regularly and upon service to the bull, the suspension of the estral period is a very good sign of conception. But this cannot be relied upon, especially in herds where there is considerable infection, as infection at the time of service may cause cessation of the estral periods. Many a non-pregnant cow fails to come in heat. The persistence of a corpus luteum in the ovary may inhibit estrum. The presence of pus in the uterus, even though a small quantity, may inhibit estrum. Also the failure of the menstrual flow to make its appearance after service may be considered as presump-

tive evidence of pregnancy. However, neither the presence or absence of the flow must be taken as positive proof of conception or absence of conception. When a cow conceives there is a change of the secretion of the cervical mucosa. In the non-pregnant cow there is a small amount of a lubricant mucus in the vagina and around the external os. During estrum it increases in quantity. Subsequent to pregnancy the secretion changes. There is less mucus in the vagina and it is of an adhesive nature rather than lubricant. An adhesive mucus seals the cervical canal and frequently projects into the vagina and uterine cavities. This seal of pregnancy may be easily determined by vaginal examination in about thirty days from conception. The presence or absence of this adhesive mucus in the external os cannot be taken as conclusive evidence of the presence or absence of pregnancy. Very frequently in certain cases of sterility an adhesive discharge is found that is not easily differentiated from the mucus of pregnancy. On the other hand, in some cases of pregnancy there is an absence of this characteristic mucus.

Much importance is attributed by some to the corpus luteum of pregnancy. A corpus luteum is always found in the ovary if pregnancy exists, but the presence of a corpus luteum in the ovary is not sufficient evidence that pregnancy exists. No distinction can be made between a false corpus luteum and the corpus luteum of pregnancy. If an animal is examined about the eighteenth or twentieth day after service and a full size corpus luteum is not found in the ovary it is reasonable to assume that conception did not occur, but its presence is not to be taken as conclusive evidence of pregnancy. Even later than this it is not always possible to determine between the so-called persistent corpus luteum and the corpus luteum of pregnancy.

The best evidence of pregnancy is obtained by rectal examination during the second month after service. It is difficult to diagnose pregnancy by an examination of the sexual organs during the first month, but one may be able to give a reliable negative diagnosis. For the first few days after service the uterus is still hyperemic whether conception has taken place or not. A few days after this symmetry of the horns with thick walls which contract on palpation exclude pregnancy. This is a sign of inflammation or of a beginning of estrum. After pregnancy the horns will not return to their symmetrical form. It is only during the second month that one is usually able to make a positive diagnosis of pregnancy. The pregnant horn perceptibly increases in size in the fifth or sixth week, the walls become firm and later quite thin, a fluctuation can be felt in the pregnant horn. Frequently one is not able to palpate this fluctuation during the fifth to seventh week of pregnancy, due to the fact that the ovum is attached towards the apex of the horn. In these cases an examination will be easier if the uterus is retracted. During the third month of pregnancy diagnosis is easy, due to the fluctuation and increase in the size of the uterus. At this time the cotyledons may be palpated. One might possibly mistake purulent or muco-purulent collections in the uterine cavity for pregnancy but in this condition there is a difference in the feeling of the uterine wall, and usually such changes in the vagina and cervix that it is easily differentiated. In pregnancy the uterine wall is firm. In pyometra it is soft and flaccid and usually the distention is bilateral. Neither do the contents move so freely as do the fetal fluids. Between the fifth and sixth month of pregnancy it may not be possible to palpate the fetus on account of the weight of the fetus having drawn the uterus forward and downward. In these cases however there is good evidence of pregnancy in that the vagina and cervix have been drawn forward and the body of the uterus is felt as a thick, firm cord passing downward and forward. This condition may be due to uterine tumors or adhesions between the uterus and other abdominal organs. But in such cases vaginal examination and the condition of the uterine arteries are of value in excluding a diagnosis of pregnancy. It might be

added that during the first few months of pregnancy it may not be possible to palpate the fetus per rectum since it may lie upon the floor of the uterus and all that can be felt is the fluctuating contents of the horn. After the sixth month of pregnancy the fetus becomes so large that it may be easily palpated per rectum.

Before considering the specific clinical conditions of the reproductive organs causing sterility, reference should be made to bacterial infections of these organs in a general way.

Most cases of sterility in cattle are due to the presence of a bacterial infection which has produced anatomical changes that inhibit the implantation and nutrition of the fertilized ovum, or which causes changes in the cervical canal that prevent the spermatozooa reaching the uterus. Occasionally sterility is due to ovarian or vaginal disease or malformation of some part of the reproductive tract, or possibly to traumatic injuries, but with the exception of the first mentioned such cases arise so infrequently that they are of little importance. Further, sterility may be due to constitutional diseases, or diseases of the reproductive organs of the bull, which will be considered in our discussion of the clinical evidences of sterility.

Perhaps in a large percentage of cases of sterility primary infection by the abortion bacillus is a cause leading to sterility, however, frequently sterility is due to primary infections other than the abortion bacillus. It is believed the abortion bacillus is not to be found in the uterine cavity of most sterile cows, but changes occurring in the uterine mucosa as a result of a primary infection of the abortion bacillus have enabled other pathogenic organisms to become established. It has been shown by Schroeder and Cotton, by Wall and others that the abortion bacillus does not persist any appreciable time in the non-gravid uterus. This is especially true where secondary infections become established in the uterine mucosa subsequent to abortion or apparently normal parturition.

It is not our purpose to enter into detail in considering the pathology of the abortion infection in the uterus, but to refer briefly to a few histological changes in the uterine mucosa as a result of abortion bacillus infection during pregnancy.

First. In order to emphasize the close relation of this infection to sterility, and,

Second. To suggest the reasons why secondary infections so frequently occur.

We wish to refer to a few cases of apparently pure abortion bacilli infection in pregnant uteri recorded by Sven Wall.

The first case is that of a cow slaughtered in the fifth month of pregnancy. He observed a diffuse superficial necrosis twenty to two hundred and fifty microns deep along the whole surface of the glandular mucosa. There was an increase in the connective tissue fibers, and there was observed in the deeper layers of the mucous membrane tubercle like nodules about two millimeters in diameter, some of which had opened into the uterine glands. The epithelium of a part of the walls of the crypts was denuded and in places there was a necrosis of the crypt walls varying from one to three hundred microns deep. There was an apparent necrosis of the connective tissue. Many of the tips of the chorionic villi were necrotic. Most of the cotyledons had a normal connection, only a few were loosened.

Another case is that of a slaughtered cow whose uterus contained an unaltered fetus in the sixth month of pregnancy. Most of the cotyledons showed normal connections, a few were loose without any lesions observable to the naked eye. He observed a diffuse superficial necrosis about seven microns deep, distinctly demarcated with an increase of connective tissue beneath. A slight superficial necrosis was observed in a few cotyledons.

Other cases are reported showing essentially the same lesions and also superficial necrosis of the chorion. From a study of these cases Wall draws the following conclusions:

The uterine lesions seem to arise first,

and then involve the chorion and then the fetus. The uterine lesions have their site, first in the gland mucosa; second, in the maternal cotyledons. The lesions are primarily a superficial necrosis with deeper seated necrotic nodules. There are secondly, exudative processes.

He states that at times healing in these cases can take place in spite of very unfavorable conditions. Healing may result by regeneration of the mucous membrane either after a purulent dissolution of the necrotic tissue, or after demarcation and sequestration of the necrotic tissue, or by organization. The healing results in the growth of connective tissue fibers, and the upper cell layer of the mucosa becomes thicker and more fibrous. Occasionally this is followed by contraction and atrophy of the gland mucosa and probably of the maternal cotyledon. It is apparent that the healing process may be easily disturbed by secondary infections, otherwise he notes that abortion or parturition affords very good conditions for healing through the expulsion of the fetus and drainage of the exudate. This latter uterine drainage is, we think, the most important condition to provide in the treatment of infections of the uterine mucosa.

(*To be continued*)

Horse Sense

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(*Continued from page* 436, *Sept. issue*)

In order to give his own ideas a fair chance, Krall started afresh with young animals. In November, 1908, he purchased two Arab male colts, Muhamed and Zarif, who afterward grew into beautiful horses, as shown by their portraits in Krall's book. They were respectively two and two and a half years old. The former proved to be the quicker pupil, the latter was slower and perhaps more inclined to periods of obstinacy, but shone in wonderful bursts of intelligence. As the reader has so far gained but an imperfect idea of the extent of education the horses had received, up to the date of the publication of Krall's book in 1912, it will be well to add extracts from the lecture notes, as it were, of the lessons. It would appear that Krall had carried what may be called psychological laboratory methods rather farther with Hans. But Hans had also made good progress in the classroom work, of which the selected exhibits here added are for Muhamed and Zarif alone:

Key to Abbreviations:

Example written on blackboard.
;=decimal point } indicated by lowering the head.
/=fraction mark }
—=minus sign, indicated by motion of head, left to right.
()=repetition by pupil voluntarily.
i=ja (yes) u=und (and) d=durch (:)
n=nein (no) w=weniger (minus) r=wurzel (root)
k=comma m=mal (times) h=hoch (power)
t=fractional mark. This "t" is the first letter of trig, the horse-spelling for Strich (dash).
a=Aufgabe (example)
m=Mohren (carrots)
z=Zucker (sugar)
b=Brot (bread)
R=right
F=wrong (*falsch*)

(p. 459) Jan. 29, 1909. Zarif begins to understand numbers.

Addition

9+1 R10 (10)
For the first time Zarif tapped 10 with the left foot. This example had already been practiced.

19+1 "You have already said eighteen plus one makes nineteen. Can you now tell what nineteen plus one makes?" R20
Z at once counts twice with the left foot, that is, 20. In a moment he counts two with the right foot and then—obviously correcting himself—20 with the left. Being rewarded for this, he repeats the 20 several times without being asked.

Decimals

(p. 461) Aug. 19, 1909. Z.
1/3 "Change a third into a decimal fraction; how many units come out?" R_0
"What comes after the zero?" R
"Right, head down means decimal point; what comes after?" R_3
"What follows the three?" R_3
"Does it go right on with threes?" R yes
Z nods emphatically several times.

A Picture

(p. 467) Aug. 20, 1909. M. A picture of 4 horses.
"What is that?" faerd (pferd, horse)
"Spell out the number, how many horses are there?" riv
"Yes, but in the right order!" veiir (vier, four)
M spells at first riv, that is to say, vir turned around, then vei, and then, of his own accord, corrects ei into i.
Of course, the correct spelling is vier (four).

Horses Use Phonetic Spelling

This is a good place to state that Krall at first attempted to follow strictly in the path of von Osten by teaching the

horse standard spelling. They did so badly that it occurred to him that that was why von Osten had so much trouble: he obstinately insisted that Hans should spell correctly. In this connection, the genial thought came to Krall to let the horses spell phonetically; whereupon they went ahead swimmingly. A good argument for phonetic spelling. The difficulty is that the poor horse, being, as it were, a little eddy in the stream of pure thought, is absolutely logical. Having been furnished a letter-board, he takes it for the sound values it represents. Thus, n being pronounced "en," and r, "er," the writing of "e" is logically superfluous, and *Herren* becomes *Hrn*. We shall have to go to the horse for spelling reform. Of course, your thorough-going, logical orthoepist of the new school will spell the same word differently, as its sound is different or strikes him differently at different times. Let us, therefore, note some of the ways of spelling *pferd* (horse) affected by Muhamed. Zarif has his own repertoire.

(p. 488) bfert, bfrt, faart, faerd, faert, farb, farld, ferd, feerd, feiert, feieirt, fpferd, frrt, fveert, fsrrnd, fvard, frd, pard, part, parbt, pfart, pfrt, ppeverd, pverd; vard, vechrd; tfert; bfabd, fed, feed, ftaft, fvad; fadrb, fbard, frad.

A little acquaintance with horse ways enables one to decipher these spellings. Where not obvious, the difficulty is probably due to the horse's hurriedly indicating the wrong square of the checker board. At any rate, what has Mr. Critic to say about "independent thinking"!

Time

(p. 467) Dec. 28, 1909. Z.
"Day before yesterday was Sunday. What week day is today?" R_2
(1=Monday, 2=Tuesday, etc.)
"The thirtieth is what day of the week?" R_4
[K. had already told Z. that "today is the twenty-eighth."]
"Since today is the twenty-eighth, and December has thirty-one days, how many days are yet to come?" R_3
"I *tell you*, my friend, that December has thirty-one days. Note it well—thirty-one days! If Thursday is the thirtieth and Friday the thirty-first, what date is Saturday?" R_1
(p. 469) Dec. 31, 1909. M. "Day before yesterday was Wednesday. What day of the week is today?" R_3
"Wrong!" My mistake; M repeats. R_5

. . . . . .

"I tell you, December has thirty-one days, and today is the thirty-first! Another month follows. What will be the date day after tomorrow?" 33
M sticks to his opinion.

. . . . . .

"Yes, but the thirteenth month is also the first month. The year has twelve months." I enumerate them.
"Hence, December is the last of the twelve months. How do you count the next month?" R_1
"Right. Sunday, what date is it?" R_2
"And what month?" R_1
"And what day of the week will it be on the second?" R_7

. . . . . .

"Now pay attention! What date was last Friday?" R_{28}
"Very well. Now be careful. What date will it be next Friday?" $F_{1,8}$
"Today we have Friday, the thirty-first of December, and tomorrow the first. Next Friday?" R_7
"And the month?" R_1

Selfconsciousness

(p. 447) Jan. 20, 1901. M is led to the mirror and asked:
"What is that?" faert (pferd, horse)
"How many horses?" one
"What color is the horse?" brown
"Who is it, then?" ig (ich, I)
"Over again, who?" ich
"What is the name of this 'ich?' Mumaet
"A letter is lacking!" ae
"No!" a
"Your surname?" Krall
"Who is called 'Muhamed Krall'?" ij (ich, I)
(p. 479) Feb. 18, 1910. Z.
56 + 44 — Z. counts 1 with the right foot; but that can mean 100.
"Yes, but the units!" R_0
"And the tens?" F_1
"Wrong!" R_0
"Go on." $R_1(=100)$
"That's right."
(p. 480) twenty × twelve with right foot 4
with left foot 2
"Yes, but there is something wrong there; repeat." $R_0 2(240)$
Now Z gives the tens correctly with the left foot and the hundreds with the right foot.
[It should be added that Z was required to read these arithmetical examples himself from the blackboard. What is reported is all that was spoken.]

Lowest Common Denominator

(p. 481) April 9, 1910. M. Finding lowest common denominator.
½+¼ Without anything being said, M. counts. R_3
He wants to count again, but is corrected. R—
Then he counts of his own accord. R_4
[M. has thus expressed "¾"]
2/6+¼+2/12 without a word spoken. R_9
9/12 "Reduce the fraction!" R—
R_{12}
R_3
R—
R_4
½+1/3+¼ without saying anything. $F_{11, 10}$
"What is the number which you can divide by two, three and four?" R_{12}
"Yes that is the lowest common denominator, and the numerator?" $F_{11, 10}$
"See here, a half is how many twelfths?" R_6
"A third is how many twelfths?" R_4
"A fourth is how many twelfths?" R_3
These questions were not put on the blackboard.
"All right, now add that together." F_{11}
"Pay attention." (Pointing to the numerators.) "Think of the other numbers which you just calculated."— — —
As I was still talking, M. counted. R_{12}
"Yes, next?" R—
"And?" R_{12}
13/12. "Yes, very fine. How many units?" R_1
"Remainder?" R_1
"Then?" R—
"Then?" R_{12}
Thus M had really calculated that ½+1/3+¼= 1 1/12, and did it himself.

Original Example

(p. 491) Jan. 26, 1911. M. dictated of his own accord: 56×3. "Reckon that." 168. "Do you know what number that is, think carefully?" Tlfon Krall (Telephone of Krall.) It was, in fact, the number of my telephone.

Feb. 2, 1911 M. A picture of a girl whom he did not know, was shown him. "What is that?" Metgen (Maedchen). On the blackboard was written: Why is it a girl? We thought, if he could

answer at all, he would distinguish her by her dress, but he spelled of his own accord: Weil lang hr hd [Because it has long hair.] "What has the girl not got?" Schnurbart [Schnurrbart, moustache.]

Feb. 7, 1911. M. A picture of a man without moustache was shown him. "What does that represent?" Man. "Why is it a man?" Weil kurz hr hd [Because it has short hair.]

Riddles

Feb. 5, 1911. "In winter it is cold; what is there besides in winter?" Schne (schnee, snow). "What is it in summer?" Warm. "What is snow then?" No. "Have you ever eaten snow?" I gut (yes, good). "Well, what do you think it is?" wasr (Wasser, water). "What besides snow comes down from above?" regen (rain). "Where does rain come from?" aus schne (from snow).

Jan. 8 and 17, 1911. M. "Now listen, Muhamed, it is white and you can eat it, what is it?" Immediate answer, z (sugar). "Now what is this: it is white and Pa (Herr Schoeller) can write with it?" Kreide (chalk). "Correct. Now pay attention, what I tell you we call 'Rätsel raten' (guessing riddles). Well then, what was that?" ratsl. Fine. "Now I shall give you another riddle: it is black and is warm, what is that?" ofn (ofen, stove). "It is white and lies outside in the yard, what is it?" without hesitation, M. answers, schne.

These extracts could be continued indefinitely. They include grammar, the use of "have" and "be," the philosophical ideas of understanding and thinking, distinction of spectacles from glasses, distinction of abstract qualities, beautiful and ugly, taste in art, making rhymes, the notion of physical power and causation, and so forth.

II

Some Conclusions

Krall manifests the true scientific restraint in refraining from spreading himself in a discussion of the wider bearings of horse pedagogy. His book, sufficiently compendious, would otherwise be intolerably drawn out. Indeed, there are other reasons; the delights of philosophy are other than those of experiment. The mental experiment is not the physical, nor does it belong precisely to the same specialty. It is wholly de-

Zariff at School. Note the Letterboard and the Board on Which Zariff's Answers Are Registered by Taps of the Feet.

sirable that some persons allow a looser rein to fancy than may those who have set themselves a definite task of experimental proof or disproof.

One objects: "These are wonderful things to do with horses. But what has been really accomplished? It is true, Hans, Muhamed, and Zarif are masterpieces of training. They evidence what man can do, if he sets out for a *tour de force*. But this work is of the same order as that of carving an intaglio on a cherry pit—a stunt, and nothing more! The educated horse cannot use or apply his own mental accomplishments."

To such hippological agnosticism, if not incredulity, several answers may be made which will appeal to different classes of objectors. Parenthetically, it may be remarked, that some men do not apply *their* mental accomplishments. Perhaps no one applies all he has.

Versatility of Krall

It has been noted how Krall improved the methods of von Osten. He simplified the wall chart or checkered letter board. He diversified the subjects treated, so as to relieve his pupils of fatigue, changing from counting to other branches of arithmetic, or to spelling, or even to grammar, to the seasons and dates, to verse, to puns and jokes, and to general conversation. The further the instruction proceeded, the more copious the possibility of relaxation and change, and the greater the incentive to progress became. The book leaves us confronted with unlimited possibilities, and overflowing with the hope that this cruel war has not condemned those equine geniuses to be cannon-fodder or—frankfurters!

The feats of these horses inspire us with the wonder that ushers in the new and unaccountable. In strict accuracy, attempts in a similar direction have not been lacking in the past. Krall has exhumed from literature several cases of equine workers on exhibition at fairs and able to perform such marvels as reading cards and dominoes, making change and distributing coins to the owners in the audience, and so forth. The fame of Kluger Hans has recently inspired several horse-trainers to fairly successful efforts along the transcendental lines and their talent has been attested by visitors to the Midway Plaisance, the Great White Way, and the Zone. But as founding a new science of equine pedagogics, the labors of the two men who are subjects of this paper are epoch-making. Like other epoch-making discoveries, the further march of this one is blocked by an indifference which is not surprising. The same thing has occurred before. Revolutions in men's beliefs are to be traced back to the convictions of a single man or of a chosen few who fight their way and make their market and their public. Astronomy and the discovery of America began in a silent belief nurtured in a single breast.

What, then, is the future of the horse, displaced by the automobile, to a great extent, but ennobled by the recognition of his spiritual powers? The question presents itself primarily as one of the horse's utility to man. The new method of education is one of direct address and conversation. Much of the habitual use of the horse and of other animals which are endowed with good hearing, depends on the same principle, but it has been entirely omitted in their formal training. It is not brought into play in the "breaking" process. It is subsequently applied through the logic of events. The driver unconsciously and irresistibly treats his horse as he would an intelligent, though defenceless, man—as he might treat a dumb slave of good hearing. The house dog is talked to as to a child, and its owner is wont to boast that it understands every word. The plowman directs his team by voice, as does the milkman, on his morning rounds. In equitation, it has not been thought good form to speak to the horse; but any horseman who will quietly whisper, "trot, gallop, rack," will find that the words greatly assist the other signals, especially in the period of training.

Von Osten became fixed in his new idea by noticing that he could direct his first Hans, hitched to a wagon, in the crowded streets of Berlin, by voice alone. It is, accordingly, more than probable that a horse which has been educated as well as trained will be much more useful. For, if he has passed the primary and common schools of the horse lyceum, he will be receptive, as long as he lives, to further instruction and to more definite guidance, and his useful-

ness will increase with age, so that his owner will take pains to prolong his years to the utmost, and will be more moved to provide for his senility.

The habit of learning makes learning continually easier. This is true of the old, as well as of the young, and of animals as well as of man. It applies to learning from sound as well as from sight or touch.

Education Increases Horse's Usefulness

There will be, therefore, a direct advantage to man to educate horses, except for those cases of extreme drudgery where it is cheaper to use a horse up quickly rather than prolong his life by lightening his work. We can hardly look to abolishing "sweat shops" for horses so long as they exist for men. Luckily, many such chores, such as the city 'bus and express wagon, are now taken over by the automobile, so that the horse by education may enter a new field, as it were, where his intelligent adaptability exceeds that of a machine, when dispossessed of the old by the new mechanisms.

But education may be useful to the horse as well as to his master. Societies for the prevention of cruelty to animals furnish, by their existence and protective activities, adequate proof that some persons, at least, recognize that horses and other animals have rights. Their exploitation must be tempered by consideration for their health, welfare, and happiness. Can we doubt that an educated horse will, in general, receive better treatment than an uneducated one? The example of the educated slave, in ancient times, may well be adduced. The greatest of philosophers, Aristotle, directed in his will that his educated slaves be manumitted; and we may well believe that his example was not isolated. The rare moderns who leave a sum of money to take care of a favorite horse, will have numerous followers, when "high-school" no longer means bits but alphabets. The educated animal will bring a higher price and will fall into the hands of the more well-to-do and intelligent masters, who are more likely to treat him kindly and patiently.

He will be able to describe his ailments. It is possible to test him for myopia and presbyopia, and soon we shall have real spectacles for horses, not mere dust goggles. It was proved that Kluger Hans could see two and a half times as far as the average man.

Moreover, the new idea will spread; and this is greatly to be desired. The civilization of a country depends fundamentally upon the existence of a large and militant educated class. The remainder of society outwardly imitates the leading class, and this imitation reflects inwardly upon thoughts and manners. The dissemination of a diplomatic, or even of a benign, attitude toward horses and dogs and other animals will elevate the moral atmosphere, and will penetrate from the stable into the kitchen and sitting-room, and even into such gatherings as may supplant the fast disappearing barroom, as a social center.

Unbiased observation, however, teaches that horse-education will claim its victims, as has the enfranchisement of women and negroes. The trouble comes from the backward elements of the population and is incident to the change in their modes of imitating their superiors. When it is at last recognized that a horse possesses the reckoning powers of a twelve-year-old, normal youth, that class of men which is subnormal in this respect, not attaining to these powers till later in life, if at all, may not be conciliated toward the horse. They may, so far as they are at first touched by the new horse-era, be filled with rage and jealousy. By nature incapable of the patient, kindly attitude, this type of man is more than likely to break out in curses and blows. This will be the point of the history of equine transcendentalism where the custom of the just may well crystallize into legislation directed toward the morally weak.

So, on the whole and ultimately, it is to be expected that the new hippology will make for the economic, mental, and moral uplift of man and beast.

The effects of the psychological discoveries of von Osten and Krall upon our formal ways of thinking are likely to be no less than those upon man's treatment of the horse. Indeed, it would be difficult to foretell which movement,

the pedagogic utilitarian or the philosophical scientific, will take precedence. To begin with, it is equally possible that the current in favor of horse-education may first get a good start before it attracts the attention of academic circles, or, on the other hand, that the latter may be the prior to become impressed with the significance of the new psychology and may elaborate its possibilities in the realm of speculative science, so that, through the transition stage of laboratory experiments, the new learning may at last develop into the horse university. It will certainly be a long time before the public frankly accepts this new conception of animals.

While extended treatment of the speculative consequences above alluded to evidently falls outside the scope of the present article, it would be plainly inappropriate to neglect them entirely. The reader's indulgence, therefore, is craved for a brief discussion of a topic as important as it may be tiresome.

(*To be continued*)

Lameness: A Consideration of Predisposing Causes as Aid in Diagnosis

By M. H. McKILLIP, M. D., V. S.,
President McKillip Veterinary College, Chicago

THERE are some notable examples of lamenesses characteristic of certain breeds and families of horses, but upon the uses to which horses are put depends, more than on the breed, the lamenesses to which they are exposed. As the breed of the horse determines very largely its use we will discuss these two predisposing conditions together, and as one.

As an example of a breed characteristic, we may mention that, while sidebone is strictly a disease of the heavy horse, the Percheron is immune to the disease and the Belgian is partially so. As to family characteristics, every practitioner is familiar with one or more strains of animals, especially of the light type, through which runs some one lameness due to a peculiar inherited family quality. As an aid in diagnosis a recognition of these conditions is of great value.

To facilitate discussion of this phase of predisposing causes it will be necessary to enumerate some of the prominent factors, related to breed and uses, that are productive of occult lamenesses. Weight support is one of these factors, certain lamenesses being the direct result of this function of the locomotory structures. Traction is a second cause. This is due to the action of heavy muscles in the drawing of great loads; to the tension of the tendons; to the pressure on tendons; their sesamoid inclusions and bursae at points of reflection; and the strain on their osseus insertions. To a less extent traction may influence the bony columns and their ligaments, especially at the angular joints. Collar pressure is also a factor in lameness in relation to use of the animal. Injuries to the shoulder girdle structures, particularly in young draft animals, should receive early consideration in an examination of that type of animal.

Concussion is a rather potent cause of lameness in speed animals, but never an important factor in the slow-going draft horse. It plays an important part in the production of lameness in the runner, the jumper and the saddler, and to a great extent also in the trotter and pacer. Concussion causes injury to the articular surfaces, especially in the straight joints, to interosseus ligaments, to the articular extremities of the bones themselves and often to the shafts of the bones, as is evidenced by the condition known as buckshins in the young running horse.

A factor of greater importance than concussion is that of forcible over-extension of joints of the lower limbs, active only in speed animals, varying somewhat with the type of speed animal, and an important factor even in the

absence of faulty conformation. Behind the digital articulations and the fetlocks in both the front and hind limbs, and behind the knee are structures that act to limit extension of those joints. This function is not executed by articular ligaments, but by suspensory structures, check ligaments, flexor tendons, and the tendonous intersections of the muscular bodies of the flexor muscles. The true articular ligaments play but little part in protecting those joints against over-extension. The importance and complexity of the structures in question warrant a careful study of their anatomy and particularly their action and uses. The sudden, severe and repeated strains thrown on these structures by the speed animal tries their endurance to the limit.

The heavy breeds, where used in their proper sphere of usefulness, for draft purposes, are subject to their own peculiar lamenesses. While almost any type of lameness may occasionally be found, those that develop as a result of weight support, collar pressure, and of traction predonderate to a marked degree. The slow-going, heavy animal, carefully selecting its footing and balancing its muscular action, does not frequently develop lamenesses of concussion origin nor those due to injury to the check and other ligaments or to the musculotendonous structures of the purely weight-supporting joints. Corns and side-bones are common in this class of animals; also those lamenesses due to collar pressure; and those due to muscular traction, as myositis, synovitis, and tendonitis of the heavy traction structures. The large feet with the manner of shoeing of these animals makes foot injuries also common.

The light types of horses, being used at rapid paces and with no load to pull, become subjected chiefly to lamenesses of concussion origin and to lamenesses due to forcible over-extension of joints. The rapid series of blows falling on the bearing surfaces and other portions of the bony columns in the limbs of these animals, especially the ambitious and high-acting ones, may produce greater reactions than normal processes can keep repaired. Also at high speed they are not able to select their footing or to correct missteps and unequal pressure on bearing surfaces, and unequal stress on lateral and interosseus ligaments may be brought to bear forcibly, and lameness result. The sudden and repeated over-extension of the joints in the lower parts of the limbs, at times when they are not properly protected by muscular support, throws an enormous strain on the check ligament structures. Consequently, in the light horse, splints and carpitis are characteristic. Navicular arthritis, suspensory ligamentitis, spavin, ring-bone, tendonitis of flexors of foot and knee, check ligament trouble, and sesamoiditis are other lamenesses more or less common to the speed animal.

Of the speed animals the pacer is least subject to lameness. The easy, smooth, gliding, and more or less low action of these animals protects them from injury, concussion and over-extension. Dan Patch was a notable example of this immunity of the pacer. With a conformation of hind limbs that would have caused unlimited trouble had he been a trotter or runner, Dan Patch raced year after year without developing a disability of any consequence. His even temper and good manners also had much to do with this immunity from lameness.

The trotter and pacer are particularly prone to diseases of the flexor structures of the knee and foot. As mentioned above these structures are concerned, not only with the flexion of the joints, but also with the limitation of extension of those same joints. The tendinous intersections of the muscular bodies of nearly all of these muscles, together with the check ligament auxiliaries, allow them to act in the capacity of ligaments, and upon them falls a considerable portion of the tension when the limb is forcibly extended. High speed at the trot or pace is unnatural to the horse, the gallop being the natural gait for speed. To develop a high speed at these gaits the forelimbs are used, in addition to their weight-supporting and transporting functions, to add some slight propelling power to that furnished by the hind limbs. The high action required, the forcible ground contact, and the backward thrust of these limbs ap-

plies a powerful force of over-extension to the knee and digital articulations particularly, and to a great extent also to the fetlock. The damage that accrues is obvious. Concussion troubles in the hock, knee, and metacarpus are also common.

The runner's troubles are similar, but vary in frequency and character. Concussion troubles are more frequent than in the others and often more severe. Even the shafts of long bones below the knee may suffer in the young runner, giving rise to buckshins, and the expanded articular extremities are more frequently the seat of periosteal inflammation and exostoses. The enormous strain on joint structures in these animals produces over-extension troubles but, in contrast to the trotter and pacer, the fetlock of the fore and hind limb are the seats of greatest injury, while the knee and digital structures are slightly less exposed.

The saddle horse and the hunter are more or less similar in their predisposition to lameness to the runner. Their good manners, their training, their careful and precise movements protect them, however, from that extreme danger of injury to which the runner is heir by reason of his reckless and daring disposition. The coach horse and the trotter may be similarly compared.

The relation of these two predisposing causes to lameness and the aid that is derived by considering them in diagnosis is a subject which offers much food for thought and study. Only a general outline is given here; the numerous details of the subject and their relation to other branches of the subject of lameness will be brought out more fully in subsequent articles.

BOOK REVIEWS

The Conservation of Food Energy

By Henry P. Armsby, Ph. D., LLD. Director of the Institute of Animal Nutrition, Pennsylvania State College; Expert in Animal Nutrition, United States Department of Agriculture. Pages, 65. Published by the W. B. Saunders Company, Philadelphia. Cloth, $.75 net.

Since the nation is confronted with the problem of maintaining the food supply for itself and for its allies in the face of all the difficulties incident to war, this little volume will be welcomed as supplying definite information regarding the values of foods and feeding stuffs as sources of energy. The accumulated results of extensive laboratory research, as set forth by the author, cannot but be of value in the present food situation.

It is pointed out that the ultimate object of all food control is the recovery of the greatest practicable amount of food value from the products of the soil, and in the computation of this efficiency it is shown that the energy of corn may be most completely utilized by milling it and using the corn bran for stock feed, and that considerable energy is lost when corn is fed directly to animals.

The chapters relating to the feeding of cattle are especially interesting and enlightening, and while the study is primarily for the purpose of securing figures regarding the dietary of man, some valuable suggestions may be gleaned as to fattening cattle. From the data given it is very obvious that there is a great loss of energy in the conversion of vegetable into animal products, i. e., in the feeding of stock, and it appears that from thirty-nine to eighty-six per cent of the energy of grains consumed by animals is lost in one way or another and only from fourteen to sixty-one per cent recovered for man's use. Hence, the diversion to stock feeding of any material edible by man is, from this standpoint, a very wasteful proceeding. It is also of interest to note that in this respect the loss is especially large in cattle and sheep, while in pork and milk production the losses are notably smaller. This is due in part or attributed in part to the extensive fermentation which occurs in the stomach of cattle and sheep and in part to the relatively large proportion of inedible material contained in their bodies. The point is made clear that the vegetable products should be utilized as much as possible as human food, leaving only the by-products to be fed to stock.

AMERICAN JOURNAL of VETERINARY MEDICINE

Published Monthly by
AMERICAN VETERINARY PUBLISHING CO.,
9 So. Clinton St., Chicago

GUARANTEED PAID CIRCULATION OVER 8,500 MONTHLY

Address all communications to the AMERICAN JOURNAL OF VETERINARY MEDICINE, 9 South Clinton Street, Chicago, U. S. A.

Subscriptions from the United Kingdom should be sent to Messrs. Bailliere Tindal & Cox, No. 8 Henrietta Street, Covent Garden, London, England.

Major's Rank Not for Veterinarian

The *Army and Navy Journal* publishes among the decisions of the Comptroller, the following: "The appointment or promotion of veterinarians to the rank, with pay and allowances of a major, is not authorized by existing law."

Interpreted, this signifies that all veterinary officers who are of the permanent organization (formerly known as the Regular Army) having the rank with pay and allowances of major, are to be ranked as captains, with captain's pay and allowances.

All of those who were commissioned as majors who were in the regular army must, as we interpret the law, be reduced to the rank of captains, unless they are promoted to lieutenant-colonels. As the number of lieutenant-colonels that is required is limited, very few will receive promotions. Others will be demoted, and probably in many instances, such officers will be ranked and succeeded by officers who very recently were civilians. As soon as peace is declared, the highest rank attainable by a veterinary officer will be that of captain. This will have a very bad effect upon the veterinary profession as a whole, and it will reflect in a disgraceful manner upon the veterinary corps of the army.

The medical corps will have officers who rank as generals, and the dental corps will retain officers ranking as colonels. Why should the veterinary corps be discriminated against? Are its members less worthy or able? Medical officers who have had occasion to make comparison are emphatic in their statements that veterinary officers have made as good a showing as they have. From the observations of the writer, veterinary officers have had better opportunity to excel in a military way and they have taken full advantage of this opportunity.

The veterinary corps should be entitled to the same proportion of colonels, lieutenant-colonels and majors as the medical and dental corps. This rank is necessary in the veterinary corps just as it is in the medical and dental corps. It is no secret that the management of the veterinary corps, since it has been placed in the medical department of the army has been a disappointment. Mention has been made in these pages heretofore, of the unending delay in matters veterinary. When authority had been granted by congress and when war was impending not a move was made to organize the veterinary corps, for more than a year. During the same period the greatest activity in preparing the medical corps prevailed, from the Surgeon General's office down. No effort has been made by those in authority to assist the veterinary corps in obtaining necessary and substantial recognition beyond that which now exists. Is it not time that the veterinary officer received consideration? If the law is to impose a handicap upon the veterinary corps, the law should be amended and the wrong righted. Our

pride as veterinarians surely will not allow us to sit by and allow this state of affairs to continue.

To bring about even the most obviously needed legislation to provide for greater efficiency in the veterinary corps and to correct flagrant injustice to veterinary officers may be no easy task at this time when the attention of congress is so wholly engrossed with weightier matters, and the effort that we must make must be commensurate with the probable difficulties of the task. The welfare of the army, the interest of the nation, patriotism, will brook no less.

The legislative program should of course be handled by the A. V. M. A. The funds for work of this nature, the association has amply provided. The success of the attempts will lie in no small degree with the personnel of the Legislative Committee. President Moore is not likely to perform a more important service during his term of office than the selection of the committee to espouse the cause of the veterinary corps of the army. The members of this committee should be selected for what they can do; they should be men who have, or whose friends have entree to administration circles in Washington. It is a time when matters of personal friendships and particularly personal dislike on the part of the president of the A. V. M. A., should have no influence in the selection of this committee. There have been presidents of the A. V. M. A. who subordinated the efficiency of the legislative committee to their desire to reward their friends and punish their enemies. V. A. Moore is not rated thus.

WASHINGTON MONUMENT, CAPITOL SQUARE, RICHMOND, VA.
From left to right: Capt. J. V. Lacroix, Camp Lee, Mr. C. V. Haver of Kansas City and Capt. C. M. Haring, Camp Lee.

A VOICE FROM DARKEST EGYPT

A New Jersey reader sends us a copy of the "Official Proceedings of the Third Agricultural Convention" of the New Jersey Department of Agriculture. The report contains an address by the Hon. Lawrence Y. Sherman, United States Senator from Illinois, in which the following paragraphs occur:

> He (the farmer) knows about all the domestic animals and their habits, how to care for them, how to doctor them in their diseases, what kind of feed they need to keep them living. Of course, we now have veterinarians, as they call themselves, but I would, for my part, just as lief go down in what we call Egypt in southern Illinois, and take a 75-year-old farmer to doctor the average animal, as to take people who come from colleges and have the technique of the profession, and talk in language that no ordinary mortal can understand. If a horse understood the language and knew the long Latin names, he would be so proud that he wouldn't work when he had a disease of that kind.
>
> But still the farmer knows about the livestock, he has a touch of the blacksmith in him, he learns how to tinker all of the farm machinery, he can work on a self-binder, he can cobble up a mower, he can doctor a corn planter, he can make a harrow, he can build a coal house, he can shingle a roof, he can mix paint, or buy it already mixed and use it—he can do all those things.

and so on ad nauseum to use a phrase the senator's fling at the world-wide system of scientific nomenclature suggests.

The report of Senator Sherman's

address fills twenty-one pages of the official report and betrays in every paragraph the same profound ignorance of agriculture that it does of veterinary medicine in the first paragraph quoted above. It is insipid, silly, or absurd from beginning to end. Among other matters unrelated to the general wanderings of his theme, the senator criticises (destructively as is his wont always) the public school system, pointing out its great inferiority to the school system of which he is a product, and takes occasion to voice his pride in the fact that he possesses no college degrees. This same fact is doubtless a source of satisfaction to the colleges wherever he is known.

We suppose our New Jersey reader censures Illinois for this senator; but he is in no position to cast stones. Senator Sherman is a political accident that is unlikely to re-occur, but what can be said for the New Jersey board of agriculture that printed his speech? To quote the independent *New York Times*:

> Before we entered the war (Mr. Sherman was a hearty, two-fisted fighter in favor of yielding to Germany. Since our entrance he has officially certified to his own loyalty in each speech, and from that point has proceeded to instill as much doubt and disaffection about the war and the Government into the minds of his hearers as he possibly could.
>
> A year ago he was trying to frighten us by telling us that we had bought into a bankrupt concern. That argument does not seem to be going very well, so he drops it and now seeks to frighten us by telling us that the President and those around him are using the war as a pretext to erect a socialistic autocracy.

Unfortunately Illinois cannot express her opinion of Sherman at the ballot box until 1920.

Army Veterinary Corps Miscellany

VETERINARIANS in the army bases have been given more authority in appointments and reduction of the enlisted personnel of the veterinary corps by a general order just issued by the war department.

In divisions, the division veterinarian may promote enlisted men up to the number authorized.

In hospitals, whether veterinary, base, corps, or army mobile, promotions may be made by the veterinarian in charge, except that while any of these units are in a training school, any such appointment must be approved by the senior veterinary instructor.

In veterinary detachments assigned to auxiliary remount depots or to remount squadrons, or to any other detached command, the veterinarian will appoint farriers, horseshoers, cooks, privates first class, and saddlers. Corporals, sergeants, and sergeants first class will be issued warrants by the surgeon general on recommendation of the veterinarian.

Any veterinarian may make a reduction in any place where he is empowered to fill the vacancy.

The M. E. R. C. men in the 1918 classes of the various veterinary colleges have been assigned to the training school at Camp Greenleaf to the number of nearly 500, and still more are going there. At this school there are also a considerable number of veterinarians who have been out of school two years but have been inducted into the army as privates in various ways. They are given examinations for commissions in advance of the 1918 graduates, and during the month something more than two

One of eleven American horses recently destroyed for glanders on the St. Mihiel salient. The revolver has been fired and recoiled. The animal is dead and will have fallen before this reaches you.

A COMMON SIGHT ON THE SECTOR HELD BY THE AMERICAN ARMY ON THE WESTERN FRONT.

A well known American veterinarian was quartered in the building shown on the left. Identity to be revealed after the war is won.

hundred have been examined. It is expected that the 1918 classes will be given examinations soon. They are, of course, anxious for commissions but realize that their training as privates, which includes both foot and mounted drill, will be valuable to them as officers. They are kept busy from morning till night and as the weather has been extremely hot at Fort Oglethorpe they are rapidly getting rid of any surplus fat they may have carried.

There are more than three hundred veterinary officers also in training at Camp Greenleaf.

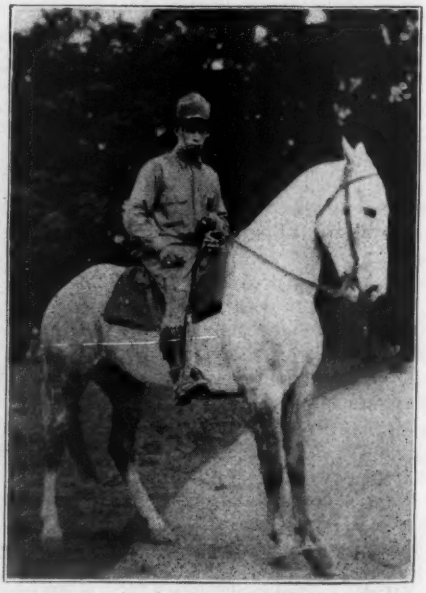
The recent general order combining all parts of the army, the regular army, the national guard, the national army, the various reserve corps, into one army to be known as the United States Army, placed the status of civilian veterinarians who have recently taken an examination for commissions in the veterinary officers' reserve corps in doubt. The veterinary reserve corps along with the medical reserve corps and all the other reserve corps of the army, are probably abolished by this order, which may mean that from now on commissions will be given only to those in military service. To put it another way, it will be necessary to enlist as a private before taking the examination for any commission. A ruling on this matter from the Judge Advocate General is awaited.

Col. Morse, Director of the Veterinary Corps, reports that while the men are responding to the call to take examinations for commissions in the corps in considerable numbers, there has not been the response from veterinarians that the department had hoped for. It is desired to establish a waiting list, and any veterinarian within the new draft ages who passes the examination for a commission in the veterinary corps will be by that fact withheld from induction into other branches of the service until the time comes for the veterinary corps to call him into active service.

Lieut.-Col. Marshall has returned to Washington from a three weeks' tour of inspection of army remount depots in the large southern camps.

Major John H. Gould and Lt. Joseph F. Derivan spent a few days at Camp Upton, Long Island and Hoboken, N. J., on their way overseas with the 88th Division.

Capt. Russell E. Elson, V. C., N. A., Camp Upton, Long Island, attended Capt. Lawrence A. Mosher of Camp Dix as best man at his wedding July 31, 1918, when he was married to Miss Arlye Fuller of Hillsdale, Michigan, at



2ND LT. N. D. SNELL, 329TH F. A., 85TH Division "Over There."

FIRST LT. R. B. THAYER AND A GROUP OF AMERICAN CAVALRY OFFICERS
The two in the center, one sitting and one standing, are French officers.

the First Episcopal Church, Jersey City, N. J.

Second Lieutenant Harrold L. Campbell, V. R. C., reported for duty with Depot Brigade No. 152, Camp Upton, Long Island, August 9. Lt. Campbell has been at the Veterinary Officers' Training School at Camp Greenleaf, Georgia.

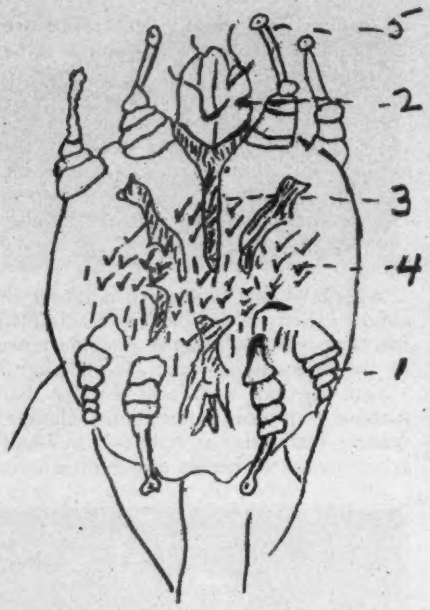
Second Lieutenant Spencer K. Nelson, V. C., U. S. A., received his promotion to a 1st lieutenancy August 3. Lt. Nelson accompanied the 88th Division overseas.

Capt. J. V. Lacroix has charge of the construction of a model base hospital for the veterinary training school at Camp Lee, Virginia. This school has enrolled 3,000 students, who will be given instruction in base hospital work for service overseas. The hospital when completed will be ideal in its appointments, containing an office, dispensary, sterilizing room, equipment room, operating room, forge room, and five hundred stalls. Attached to it will be a reception yard and stable, a convalescent yard and stable, an issuing stable, a stable for service animals, a feed barn and feed mill, officers' quarters and barracks for the men. The hospital will derive its patients from the remount station at Camp Lee.

Overseas, mange continues to be the most serious problem confronting the veterinary corps, and every effort is being made to bring it under control before the onset of winter, when unless it be brought under control, it is expected to be far worse than it is at present. The prevalence of mange some months ago and its seriousness may be judged by the recent report of one hospital unit, which had in its charge at that time almost 1,000 disabled animals. Of this number 100 per cent were reported as having mange.

A total of just under two hundred, or almost exactly 20 per cent, were disabled for other causes, ranging in importance in the following order: Lymphangitis (about one-half of all cases other than mange); quittor; laceration; abscess; fistula; cellulitis; scratches; poll-evil; roarer; canker; hernia and gonitis.

COL. L. A. MERILLAT, SR.
It has just been announced in the daily press that Maj. L. A. Merillat, Sr., of Chicago has been promoted to colonel in the veterinary corps, making him the highest ranking veterinarian in the army and constituting a signal recognition of Col. Merillat's splendid services on the Franco-American Veterinary Liaison Mission. Promotions in the expeditionary forces are made only upon the recommendation of Gen. Pershing and must be earned in active duty to be obtained. The same dispatch told of the promotion of Capt. L. A. Merillat, Jr., to a majorate. L. A., Jr. is twenty-six years of age, a graduate of West Point, and one of the youngest majors in the army.



Sarcoptic Acarus (male). 1. Hind legs do not project beyond body outline. 2. Head short and maxillae very strong. 3. "Y" marking below the head. 4. "Spines (V)" and "Pins" on the back. 5. Suckers mounted on long unjointed pedicle.

This report is for a day last April and is not a typical report at the present time, but it shows the vast prevalence of mange among our army horses in France and the urgent need for control measures. These, it is believed, will be made effective with the large number of veterinarians that have proceeded overseas in the past few weeks.

The line of treatment in the A. E. F. is now as follows:

1. Horses will be thoroughly cleaned by good grooming, washing and scrubbing, and clipping when necessary before receiving mange treatment.

2. Dipping and hand treatment method.

Constituents: Fresh unslaked lime, 10 lbs.; sulphur sublimed, 22.5 lbs; water, 20 gallons.

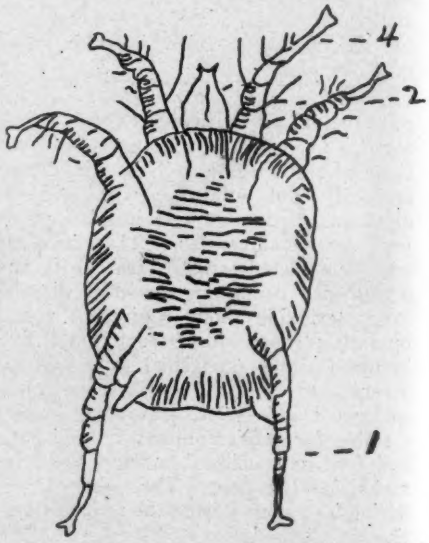
Procedure of making: Into a boiler having a capacity of about 30 gallons or more, put 20 gallons of water. On a wooden or cement surface spread the sulphur in a layer about 2 inches thick, the lime being put in a heap in the center of this, and water taken from the original 20 gallons added, stirring steadily. More and more water is added until a complete mixture results, of the consistency of paste. The water in the boiler having been brought to the boil the paste is added, and the mixture kept stirred and boiling steadily until all solid matter is dissolved and the solution is a dark chocolate color. This takes about two hours, and care is required to prevent boiling over.

Dilution: To one part of the chocolate solution add three parts of water.

Mode of using solution by hand: For applying the preparation to a large number of horses, it is necessary to have another smaller boiler, such as a "soyer," where the solution can be kept at such a temperature that the operator can just bear his hand in it. This is baled out into a bucket, and from that into bottles holding about a quart.

The usual procedure is to have the dressers, with a filled bottle and a Dandy or body brush, begin on the legs and work from knees and hocks down, rubbing the application well in.

After this is done, apply bandages soaked in the preparation as hot as the hand of the operator can use without discomfort. In case the dresser should



Psoroptic Acarus (male). Characteristics: 1. Hind legs project beyond body outline. 2. Head longer than broad. 3. Absence of "Y" marking. 4. Small sucker mounted on a long jointed pedicle. 5. General outline of body markedly longer than it is broad.

find the contents of his bottle getting cold when applying, it should be emptied into the boiler and replenished from the hot. After the legs have been done,

At the left: Leg of symbiotic acarus (showing sucker). 1. General outline similar to psoropt. 2. Hind legs project beyond body outline. 3. Large suckers shaped like champagne glass mounted on a short unjointed pedicle. At right: Acarus farinae, a parasite found in bran, oats, etc., causes a great amount of skin irritation in animals, frequently causing a mistaken diagnosis. A careful study of the booklet on this parasite will serve to differentiate it from the suckers of the true acarus of mange.

commence at the poll and work to tail, and finish up with the head. A mop or swab on a stick soaked in the solution should be used to be inserted in each ear; another swab should be used for the sheath, both of these places being favorite hiding places of the parasites. When treating the head, care should be taken not to let any of the solution get into the eye, though if this should occur it occasions pain to the animal for about ten minutes only. After the patient has been dressed he should be blanketed until dry, when the rug and bandages can be removed.

Grooming twice daily should be carried out as usual, care being taken to disinfect the brushes each time after use. In seven days after application the patient should be thoroughly washed with soap and water, and the following day receive the second dressing, carried out in a similar manner to the first. A third and, in some instances, a fourth dressing will also be applied with intervals of seven days. Owing either to friction or the caustic nature of the dip, it is found that the dressers' fingers get very sore after being employed in this work for two days. The application of grease around the finger nails and the use of woolen gloves will lessen this to a large extent.

The main points to be observed are:

1. The solution must be freshly prepared in accordance with directions.
2. During application it must be kept at the right temperature—100 to 104°.
3. Thoroughness in application.
4. Good grooming.

Sulphur fumigation: The type of machine to be used for sulphur fumigation will be constructed sulphur chambers.

One and one-half pounds of sulphur will be sufficient to treat ten animals.

They will be left in the chamber one and one-half hours.

Three exposures to this gas treatment will be given at intervals of six days.

The cure of mange in animals with cold solutions of coal tar products is not a success, and only of doubtful success with hot, and then in very mild cases.

Major John H. Blattenberg is reported to be pleasantly located in a little mountain village in France, industriously conferring degrees in his well known, illustrious order, and to be the feature of his division among officers, high and low. Up until the present, his sector has been a quiet one on the western front, and that means it is disturbed only by intermittent shelling from long range guns, by daily air raids, and by occasional raiding parties.

MAJ. ROBT. A. McAUSLIN, "OVER THERE."
Dr. Robt. A. McAuslin of Brooklyn, is the only veterinarian promoted to a majorate after going overseas.

Lieut. F. R. Smith, formerly of Burrows, Ind., was probably the first veterinarian to go to Italy with the A. E. F. Word has been received by relatives that he likes his work well and has plenty of it to occupy all his waking hours.

As reported some months ago, Major Geo. McKillip is still in charge of base hospital No. 6, the one established and organized by Major L. A. Merillat, when he first went to France. This is said to be the best equipped veterinary hospital in any army in France. First Lieut. A. A. Leibold of Chicago is in charge of the laboratory. This laboratory is concerning itself mainly with experimental and research work on lymphangitis. Lt. Wight, formerly of Pittsburgh, is in immediate charge of the clinical investigations of lymphangitis.

Those who have tried to purchase laboratory equipment in the United States recently will realize with what difficulty the laboratory in this base hospital up near the front line in France was equipped.

First Lt. B. R. Thayer, formerly of Morris, Ill., being now in the A. E. F., in a letter published in the *Morris Herald*, writes interestingly of gas chambers for the sulphur dioxid treatment of mange that he has recently had installed, and in which he can treat eighty-nine animals per day. He speaks of being exceedingly busy from daylight until dark, and says that the gas chambers are objects of great interest to army officers, from generals down, and that many visitors come daily to see them. Lieutenant Thayer has been recommended for a captaincy.

A veterinary officer attached to one of the field artillery units in France, gives an interesting account of some of his experiences. In part he says: "I have been here six months and am well pleased with my lot. I am as busy as one can be. Practically all of our horses were purchased from farmers in France, and consequently I have had an abundance of influenza and all that goes with it, such as pneumonia, purpura hemorrhagia, etc.

"Mange is one of our big troubles and I was exceedingly pleased with the article in the Journal on this subject. It was just what we needed. Another trouble I have is making the French horses understand English, but I am slowly teaching them this art."

RECENT APPOINTMENTS, ASSIGNMENTS AND PROMOTIONS

Griffin, Maj. C. E., promoted to be a lieutenant-colonel.

Leininger, Capt. D. B., appointed major.

Tunner, Maj. W. G., to Camp Lee.

Constable, Capt. G. W., promoted to be a major.

Lange, Maj. A. F., to Camp Lee.

Lacroix, Capt. J. V., to Camp Lee, duty as commanding officer of the Camp Veterinary Hospital.

Johnston, Capt. W. S., to Camp Greenleaf.

Fraser, Capt. A. G., and Fulstow, Capt. P. H., relieved, Camp Logan, report to C. O.

Following 1st Lts. appointed captains: Andrews, A. R., Derivan, J. F., Prudon, V. F., Chase, C. S., Porteus, R., Bell, R. M., Ingram, S. R.

Mr. L. W. Wynn-Lloyd, M. R. C. V. S., and daughter Ioan, Carnavon, Wales. This picture was taken in front of Mr. Wynn-Lloyd's veterinary hospital. The building shown in the background is the Garrison church, and is more than 800 years old. Mr. Wynn-Lloyd writes to offer hospitality to any American veterinary officers who may be on leave near or passing through Wales. Carnavon is only three hours from Liverpool, and is one of the most romantic and picturesque locations in the entire kingdom. Mr. Wynn-Lloyd was with the British expeditionary forces during the first two years of the war and until discharged for disability.

Smith, Capt. L. E., assigned to Hosp. No. 13 at Camp Lee.

Promoted to captaincies: 1st Lts. Meador, D. J.; Smith, L. E.; Brower, G. W.; Torgersen, H. E.

Torgersen, Capt. H. E., assigned to Hosp. No. 16 at Camp Lee.

Dean, Capt. G. H., relieved from duty at Camp Devens, on arrival of 1st Lt. A. H. Douglas, and will proceed to Macon, Ga.

Lieut. R. F. Smith, V. C., and Officer of 333rd Inf., On the Italian Front.

Webb, Capt. W. W., relieved from Macon, Ga., and will proceed to Ft. Oglethorpe.

Drayer, Capt. J. H., to Camp Jackson.

Holton, Capt. D. J.; Frederick, 1st Lt. H., and Devine, 1st Lt. J. P., to Camp Lee.

Scully, Capt. J. R., to Fort Sill.

Martien, Capt. H. D., to Camp Greenleaf.

Douglass, 1st Lieut. A. H., promoted to be a captain.

Rice, 1st Lt., to Camp McArthur.

Stewart, 1st Lt. R. B., to 58th F. A. at Camp Jackson.

Harrington, 1st Lt. E. V., to Evac. Hosp. No. 28, at Camp Sherman.

Beauman, 1st Lt. H. G., to Camp Lee.

Ruby, 1st Lt. A. N., to Camp Taylor, with 68th F. A.

Bell, 1st Lt. R. M., to Camp Meade, as veterinarian.

Benney, 1st Lt. J. E.; Buck, 1st Lt. F. L., and Hinkle, 1st Lt. T. B., to Washington.

Barower, 1st Lt. G. W., from Philippine Department and report to Cmdg. Gen. as Asst. to Department Surgeon.

Fast, 1st Lt. C. A., to Camp Greenleaf.

Catlett, 1st Lt. J. G., to Ft. Keogh.

Hardenbergh, 1st Lt. J. B., to Camp Lee.

Bennet, 1st Lt. B., to report to Cmdg. Off. at Camp Logan, as veterinarian.

McKinnon, 1st Lt. J. A., from Philippine Dept. to San Francisco and report to Adjt. Gen. and Surg. Gen.

Andrews, 1st Lt. A. R., to Camp Shelby.

Whipple, 1st Lt. R. O., to Camp Kearny with 66th F. A.

Rogers, E. K., commissioned 1st Lt.

To Camp Lee: 1st Lts. Merriman, C. M., Reihart, O. F., Shore, C. B., Smith, W. C., Magley, L. K., Runnels, R. A., Griffin, C. J., Hoffman, C., Edwards, J. R., Hanson, C. A., Martin, D. C., Herndon, F. C., Becker, P. C., Smith, G. T., Smith, L. E.

Martindale, 1st Lt. E. C., to 58th F. A. at Camp Jackson.

Williams, 1st Lt. E. J., to Camp Bowie, with 49th F. A.

Moore, 1st Lt. B. A., to Camp Bowie, with 57th F. A.

Vanskike, 1st Lt. R. B., to Camp Sheridan.

To Ft. Oglethorpe: 2nd Lts. Frailey, B. E., Ouderkirk, Richardson, J. W. Parrish, R. W.

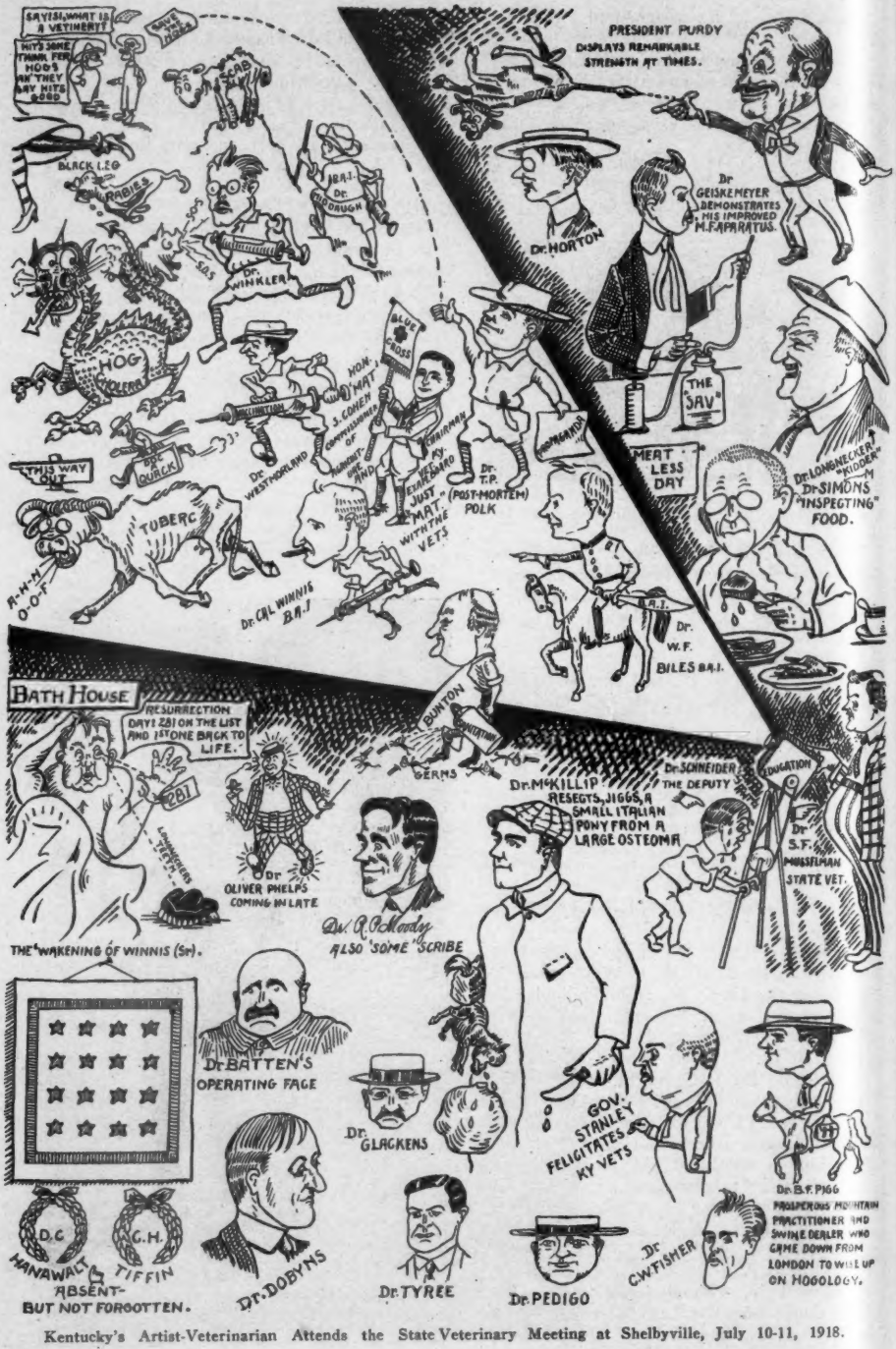
To Ft. Oglethorpe: Reid, F., Beard, R. W., Mahl, C., Robertson, W., Work, D., Meier, R., Trish, K. A., DeWitt, L. B., Wells, C. L., Graham, W. S.

To Camp Lee, Petersburg, W. Va.: F. E. Caswell; J. H. Bower; J. M. O'Neil; S. P. Holtz; Harris Allen; C. F. Neis.

To Camp Kearney: 2nd Lt. L. J. Anderson.

Veterinarians who have recently been accepted for army service: E. M. Rogers, Jr., Rice Lake, Wis.; Bryce Binnall, Dow City, Ia.; J. G. Hastings, Anoka, Minn.; E. E. Shannon, Council, Ida.; E. B. Householder, Bement, Ill.; T. M. Dick, Texarkana, Tex.

Lt.-Col. G. E. Griffin, V. C., Senior Instructor, Veterinary Training School, Camp Lee, Va.—likewise bard of the V. C.



Kentucky's Artist-Veterinarian Attends the State Veterinary Meeting at Shelbyville, July 10-11, 1918.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Trembles or Milk Sickness

SOME time ago I called attention to the preliminary work of Dr. F. A. Wolf on "Trembles or Milk Sickness" caused by white snake root (*Eupatorium urticaefolium*) or *E. ageratoides*. I have just received an exhaustive paper by Professor F. A. Wolf, R. S. Curtis, and B. F. Kaupp[1], being the joint work of a plant pathologist animal husbandman, and veterinarian. In this investigation the Agricultural Experiment Station, State Department of Agriculture, and the North Carolina State College of Agriculture and Engineering co-operated. It is a splendid monograph, the best that has been published on the subject and one of the few splendid monographs on poisonous action of individual species of plants. First of all the authors give a full history of the disease and then discuss the various theories: (1) mineral poison theory; (2) microbic theory (*B. lactimorbi*) which was isolated by Luckhardt and Jordan and Harris; and (3) the poison plant theory. About seventeen pages are given over to the history and a discussion of the theories. The records show a large mortality record. Some of these earlier records are no doubt due to error of diagnosis. Jordan and Harris tabulated some 320 recorded cases from 1829 to 1916. Experiments were conducted with hogs, lambs, sheep, and guinea pigs. Experiments were made directly through feeding the plant or products of the plant and through feeding the milk and meat. Symptoms and postmortems were observed. The more important conclusions arrived at are as follows:

1. A disease of domestic animals commonly called trembles, because trembling is the most prominent symptom, has been the subject of investigation at this station for two seasons. This disease is also called milk-sickness, since man may contract the disease by the ingestion of milk products from cows affected with trembles. Attention in this investigation has been directed primarily to the etiology, transmission, symptomatology, and pathological anatomy of the disease.

The first claim that white snakeroot, *Eupatorium urticaefolium*, is responsible for the disease seems to have been made as early as 1840. The observations and experiments of several subsequent writers support this claim as do the present experimental studies.

In previous accounts, the symptoms of the disorder appear to have been described in detail only in the case of cattle and of man. The writers have not observed the disease in cattle or in man and in their studies have employed ewes, lambs, hogs, dogs, guinea pigs, and mice. Trembles was developed in sheep, hogs, and guinea pigs, and the symptoms of the disorder have accordingly been described in considerable detail and illustrated photographically. The symptoms in sheep and hogs are sufficiently characteristic so that anyone who has ever seen an affected animal may be certain of his diagnosis.

The disease may appear at any time of the year, but is most prevalent in late summer and autumn, especially when vegetation is scarce because of drought. The disease is frequently fatal in domestic animals while the se-

[1]Tech. Bull., N. Car. Agrl., Exp. Sta. 15: 1-74, pl. 1-10.

quel of milk-sickness in man, in case of recovery, is lasting debility.

The present experiments were conducted at West Raleigh, North Carolina, about 400 miles distant from the place of collection of the white snakeroot used, and no case of trembles or milk-sickness had ever appeared in West Raleigh prior to the performance of these feeding tests.

During the experimentation, 31 fatal cases of trembles and milk-sickness were developed among the 44 ewes and lambs that were employed in some phase of the experimentation involving the feeding of white snakeroot. Two of these lambs contracted genuine cases of milk-sickness by suckling their mothers, demonstrating that the disease may be transmitted through the milk.

This fact has for a long time been a matter of common belief among farmers. Furthermore, animals in lactation, having access to white snakeroot, may be apparently normal but are capable of transmitting milk-sickness through their milk.

No febrile condition is present in affected sheep. The most prominent changes noted in the 22 autopsies on sheep which were performed consist of albuminoid and fatty metamorphoses of the parenchymatous organs. The lesions commonly include petechiation of the epicardium; the presence of a metallic color of the kidneys, which exhibit active and passive congestion and cloudy swelling; a "nutmeg" appearance of the liver which has undergone fatty changes, and is congested so that blood drips freely from the sectioned surface; the occurrence of muco-enteritis of the small intestine; and the presence of a congested condition of the brain and meninges.

All attempts to isolate a specific organism from the internal organs of six sheep, one hog, and one guinea pig were unsuccessful. This is supported indirectly by failure of diseased animals to communicate trembles to healthy ones when they are confined together and fed from the same trough.

The conclusions of this paper, it seems to me, are most important. Good authorities have arrived at entirely opposite conclusions. It would seem to me that milk-sickness may, under different circumstances, be caused by different plants or possibly a bacterial organism. At any rate, there is no question but that the white snakeroot (*Eupatorium urticaefolium*) causes milk-sickness. Not only is it poisonous directly, but it can transmit the disease through milk.

Vitamines and New Facts On Feeding Cattle

E. B. Hart, H. Steenbock, and G. C. Humphrey[2], in a recent bulletin on the above subject, made the following statements: "The prevailing theory of a balanced ration supposes that all the requirements for the successful growth and reproduction of an animal have been met when the supply of digestible protein and net available energy are adequate. This is the modern feeding standard, developed and taught by all authorities on animal feeding and used with great success by countless animal husbandmen.

"One would assume that by its use under all conditions splendid growth and strong, vigorous offspring could be produced, no matter what the natural sources of the materials involved might be. This would be true if protein and energy were the only necessities in an animal's ration; but it is becoming clearer every day that there are other important factors in the make-up of a successful ration. In this bulletin there is discussed how rations 'balanced' from restricted sources may affect growth and reproduction in cattle."

The experiments conducted by the authors are sufficiently important to warrant a wider acquaintance among veterinarians. The following summary has been prepared. I would suggest, however, that veterinarians send for this bulletin.

"Balanced rations are sometimes deficient in the elements which make for the best growth of animals. Reproduc-

[2]New Facts on Feeding Cattle for Successful Growth and Reproduction, Bull. Univ. of Wis. Agrl. Exp. Sta. 287: 1.-24, f. 1-19.

tion is often affected by the ration fed to the cow.

"Weak or dead offspring may result from nutritional disturbances brought about by the continued feeding of certain natural feed materials.

"A wheat grain with wheat straw ration is in most cases fatal to both growth and reproduction. It will also produce weak or dead calves. So far as reproduction is concerned, the same statement is true with a corn grain and wheat straw ration.

"A good roughage, presumably a legume hay, should be fed with wheat grain or its by-products to overcome their bad effects on reproduction. Even with a good roughage, wheat or its by-products should not be fed continuously too liberally, or the offspring will be weak.

"A complete ration cannot be made from the oat plant. Exclusive use of oat straw as a roughage for breeding cows will likewise produce premature, weak or dead offspring. Corn stover, corn silage, or legume hay should replace part of the oat straw.

"A complete ration can be made from the corn plant. It will give normal growth and reproduction."

In regard to vitamines they say: "These are as yet unidentified chemical substances in foods, which are absolutely necessary for growth and reproduction. Without them no growth will take place. They appear to be abundant in milk and eggs and in the leafy portion of plants. One class, soluble in water, is abundant in seeds, while another class, soluble in fat, is apparently not so abundant in seeds. We know very little about either class, but we know that both kinds must be present in ample quantity if a ration is to be complete.

"The fact that the leafy portion of plants appears to carry a bountiful supply of both classes of these indispensable vitamines adds another good reason for the use of roughages in feeding our stock. It is just those roughages with plenty of leafy material remaining, such as clover hay, alfalfa hay, and corn fodder, that are the most valuable. Those with practically no leaves and only the stems, as in the case of the straws, constitute the poorer class of roughages."

The Rocky Mountain Hemlock

The Rocky Mountain water hemlock, or the Rocky Mountain cowbane (*Cicuta occidentalis*), is common in some sections. Cases of poisoning sometimes occur. Dr. W. W. Robbins, of the Colorado Agricultural College, has just issued a bulletin on this plant.[1]

This plant is a stout perennial 3 to 7 feet tall, with large leaves divided into a number of leaflets which are sharply and finely toothed. The small flowers are white, and the fruit resembles that of parsley. The roots are fleshy, spindle-shaped, divided into chambers. The pungent taste of the root and the spindle-shaped character readily separates it from cultivated parsnip which frequently runs wild and has a conical root.

Dr. Robbins says: "The water hemlock is poisonous to stock. The eating of the root of a single plant has been known to kill a horse in a little less than an hour. Poisoning usually results from eating the roots, but there are instances in which fatal poisoning has followed the eating of the tops of young plants, and there is a strong suspicion that the dried plants in hay may at times be eaten in sufficient quantities to cause poisoning. There is evidence that the plant is most poisonous in the spring. The roots become accessible by plowing, or, as frequently happens, the earth is washed away from around the roots on ditch banks."

The plant occurs in moist places, ditches and swamps, from 4,000 to 8,000 feet elevation. Symptoms of poisoning, according to Dr. Glover, are as follows: "The first pronounced symptom is akin to acute spasmodic colic without intermission from pain. Frequent attempts at micturition and defecation are accompanied by spasmodic contractions of the muscles of the abdomen. The ani-

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[1] Extension Bulletin, Colo. Agri. Coll., Series 1, No. 139, May, 1918, p. 4, f. 1-3.

mal is in great agony, and, when prostrate, beats its head violently upon the ground. There is 'frothing at the mouth,' and in cases that last for several hours, blood may appear in the feces and urine. The spasms rapidly become more and more severe as the brain excitement increases, and the animal finally becomes unconscious and dies in the most violent convulsions."

In regard to treatment for stock poisoning, Dr. Glover says: "In very acute cases animals may die in fifteen minutes; in such, treatment is out of the question. If potassium permanganate can be administered early, it probably will be effective. Melted lard and raw linseed oil are indicated. To relieve the pain, morphine may be given in doses as follows: For sheep, 1.5 grains, for cattle and horses, 3 to 5 grains. For horses or cattle, 2 drams of chloroform or 1 ounce of chloral hydrate may be given, highly diluted, by the mouth. If the permanganate has already been given other drugs should not be given by the mouth.

"For sheep, 3 to 6 grains, according to the size and age of the animal. If potassium permanganate has already been given, other drugs should not be given by the mouth."

Forage Poisoning in Cattle and Horses

Mr. H. P. Rusk and H. S. Gridley recently reported on some investigations on forage poisoning in cattle and horses[1]. Work along this same line was laid out by Drs. Graham, Brueckner and Pontius of the Kentucky Agricultural Experiment Station. Dr. Robert Graham, chief in animal pathology, now has charge of the investigations of forage poisoning at the Illinois Agricultural Experiment Station. The chief conclusions arrived at by Rusk and Grindley are as follows:

Feeding tests with corn silage suspected of causing forage poisoning in cattle: Numerous outbreaks of forage poisoning in cattle, horses, and mules have been reported to the university, but attempts to reproduce the disease experimentally in cattle by feeding suspected or contaminated feeds have been successful.

The results of these investigations seem to indicate that most cattle are not so susceptible to forage poisoning as are horses and mules, and that contaminated corn silage and possibly other animal feeds which are unsafe or fatal to horses, may be fed with less danger to cattle. Evidence from many outbreaks leads to the suggestion that some cattle may be more susceptible than others, and that damaged or otherwise contaminated corn silage, and possibly other feeds, may in some instances produce fatal results in cattle following ingestion.

Report of forage poisoning investigations with horses at Ottawa, Illinois: Contaminated corn silage from the McLean silo near Ottawa, Illinois, induced a fatal type of forage poisoning in horses following ingestion. The most obvious and characteristic symptoms exhibited by the horses affected in this experiment were paralysis of the throat, profuse salivation, and lack of muscular co-ordination.

Prophylactic doses of botulinus antitoxin and related immune sera, developed by Drs. Graham, Brueckner, and Pontius at the University of Kentucky, protected experimental horses against the effect of the daily ingestion of contaminated corn silage, responsible for the McLean outbreak. The results of the two tests at the McLean farm apparently justify a trial of these sera in cases of similar outbreaks.

[1]Univ. Ill. Agri. Exp. Sta., 210: 161-175, f. 1-4.

Vaginal Absorption of Drugs

David I. Macht[1] has an instructive article on the action of drugs and alkaloids, and organic salts. He states these are absorbed through the vaginal walls, causing poisoning of a grave character. After experiments with cats and dogs, the author emphasizes the fact that these poisons are readily absorbed.

[1]Jour. Am. Chem. Soc., 39:2088.
[1]Jour. Pharmac. and Exp. Therapeutics, 10:509-522, f. 1-3.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

Vaccine Therapy in Surgery

By W. G. KEEHN, D. V. M., Chicago
Pathologist, Chicago Veterinary College

IN presenting this paper I shall confine myself to the use and indication of bacterins and antitoxins in the field of surgery, as the scope of vaccine or serum therapy is so great that time will not permit even a general consideration thereof.

The use of biological products in veterinary practice has increased until today the administration of bacterins, vaccines, serum, etc., constitutes a large proportion of veterinary practice.

New products are constantly being added and the value of some of them is established. It, therefore, behooves every veterinarian to familiarize himself with their use and recommend only those products which are of most value in each case, giving his client the most successful and efficient method of treating all conditions.

Before we take up the various phases of the subject, I wish to define a few terms which are used interchangeably either through carelessness or ignorance. The terms are: vaccine, bacterins, serum and antitoxins.

These terms as defined by the better authorities in bacteriology and pathology (and I believe we should all adhere to them) are as follows:

A Vaccine is an attenuated virus and produces the disease in a mild form; in other words, it contains the living organism weakened to such an extent that it cannot produce the disease in a virulent form if it is properly prepared. There are not many organisms which are used in the preparation of vaccines, the principal ones being blackleg, anthrax, smallpox, and rabies.

Bacterins are suspensions of dead bacteria and their products either in a normal saline solution or in bouillon. There are many organisms used in the preparation of bacterins. Bacterins are placed on the market under a number of names by various biological houses, the principal ones being bacterial vaccines.

Serum is the fluid part of the blood containing the antibodies formed in the animal body during the disease and counteracting the products formed by the invading bacteria. Serums are likewise prepared for a number of conditions.

Antitoxin is a substance that when introduced into the animal body neutralizes the action of a toxin. So far as is known, there are only a few diseases for which an antitoxin can be prepared. These are diphtheria, botulinous poisoning, pyocyanic infection and tetanus. I will not discuss the method of preparation of these various products, but confine myself to the use and indications of only two of the aforemen-

*Paper read before Illinois State Vet. Med. Assn., Champaign, July 9-11, 1918.

tioned products, namely, bacterins and antitoxins.

First, I will discuss the use and indications of antitoxins in surgery, the principal agent being tetanus antitoxin. All antitoxins are indicated when there is any danger of their respective disease developing and should be given before symptoms of the disease manifest themselves, as they are chiefly prophylactic and not curative agents. Tetanus antitoxin should therefore be administered in various surgical operations, all accidental wounds, such as wire-cuts, nail-pricks, etc., especially where the premises are known to be contaminated with the tetanus organism, thereby saving the owner many dollars by preventing the disease. Only recently I observed a number of pigs showing symptoms of tetanus following castration, and after three animals had died eleven others were given antitoxin with no more loss. Tetanus following nail-pricks and other wounds, either surgical or accidental, is a common occurrence and can be prevented if antitoxin is administered. It should be given as soon after the wounds are made as possible. A prophylactic dose of tetanus antitoxin is from 500 to 1,500 units.

The use and indication of bacterins, and products which are known under other names, yet in reality are bacterins, cover a greater scope in the surgical field than do antitoxins, with results probably not as satisfactory in many cases, due to one or more of several reasons.

First, because various commercial houses have recommended their use in too many conditions, not explaining in detail the method of using.

Second, by putting on the market a product not sufficiently potent to produce the desired results.

Third, that the veterinarian administering the bacterin expects too much from it.

Fourth, by the administration of too large a dose, which is followed by too severe a reaction.

The first two probably being the chief reasons, with the other two playing a very important part, that bacterins have fallen in such disrepute with so many practicing veterinarians.

There are two general methods employed in the production of bacterins: one, that of their originator, Wright, the other the German method. With the Wright method much time is required for their growth and it necessitates the use of a liquid media. With the other method the cultures are grown on solid media and only for a brief period, many less than twenty-four and none over ninety-six hours. It is the result of commercialism. According to many of the recent authorities in this field, a product of the highest standard should not be grown less than fifteen days, and if possible longer.

Therefore, according to time consumed and medium employed, bacterins prepared by the Wright method should be of the highest standard. I believe (although I have no authority for making this statement) where bacterins are grown in bouillon or liquid media that they produce some substance which is of value in a bacterin and is held in the liquid, while this substance is not contained in a product prepared the German way.

Bacterins have been recommended in such a number of conditions, and when used were found of no value that naturally all bacterins were condemned in all conditions. After prejudice is once established it is very difficult to overcome.

Many veterinarians have condemned bacterins, largely because they themselves have expected too much from them without doing their part to obtain the desired results. In case of fistulas, withers, or poll-evil, the bacterins were expected to do the necessary surgery instead of being used as an aid in preventing the spread of the suppuration

If we paid more attention to dosage, the results would be more satisfactory. All cases, as well as all animals, cannot and should not be given the same dose of bacterin, any more than all cases or animals can be given the same dose of any therapeutic agent. Some cases require a large dose while others require a smaller dose. Chronic conditions require a larger dose than the acute, to

produce the reaction in the tissues. The dose administered in an operative case should not be the same as in a case in which suppuration has developed. The successful medical practitioner, when he places a case on bacterins, takes into consideration the opsonic index as well as the systemic reaction, and the dose is increased or decreased accordingly. Where a course of bacterin treatment is employed, I believe if smaller doses are given and repeated frequently, the results will be greater than from a larger dose given at longer intervals, as the negative phase following the administration of a small dose is not so great as that following a large dose, and therefore is an aid instead of a possible detriment.

To illustrate my point, I might use the following illustration: if you want to stimulate the heart for twenty-four or forty-eight hours you would not give the maximum dose every five or six hours, but would give a smaller dose, say every hour. Why? Because you would get a more uniform action. If this is true of drugs, why is it not true of other agents?

Bacterins are of two kinds: stock bacterins and autogenous bacterins.

Stock bacterins are those prepared from laboratory cultures, and in many instances do not give as satisfactory results as the autogenous bacterin.

Autogenous bacterin is the product of cultures taken from organisms obtained directly from diseased conditions of organisms and is really the more scientific method of treating chronic suppurative conditions, while many of the acute respond equally well to the stock bacterin.

Bacterins are indicated in all of the following conditions: fistula, poll-evil, open joints, all wounds either surgical or accidental, abscess, nail-pricks, wire-cuts and in all operations before infection has taken place. I will not discuss separately the use of bacterins in all conditions mentioned but consider them all in a general way.

In treating fistulas and poll-evils, the bacterins should not be relied upon entirely; all the necrotic tissue must be removed and drainage established. It is also advisable to administer a course of bacterins before operating, as this occasionally will abort the development of the fistula or poll-evil. After an operation it diminishes the length of time necessary for healing the conditions, and when properly employed will prevent the extension of the suppurative process.

In such operative cases as criptorchid castration or straight castration, spaying, etc., it is advisable to administer a dose of bacterin and thus prevent infection with pus-producing organisms and aid in overcoming the operation in a shorter length of time, and is valuable in certain seasons in preventing strangles and other allied conditions.

In nail-pricks, wire-cuts, and open-joints, a dose or course of treatment with bacterins will aid in preventing infection of the wound and many veterinarians report excellent recoveries following the administration of bacterins in these conditions.

Bacterins accomplish their purpose by increasing the production of opsonins in the body through the endotoxin which they contain. The opsonins in turn increase the activity of the leucocytes and they destroy the invading bacteria, and prevent the extension of the suppurative process in the body.

Discussion

G. B. BLACKMAN:—My work has been more medical than surgical, and has been confined to the care of swine herds. I have used the stock bacterins quite extensively, but have used the autogenous bacterins more extensively in private practice, and I am impressed favorably with them.

In a recent outbreak of mixed infection in swine, I had in nearly 5,000 cases in one herd, about 3 per cent mortality with the use of autogenous bacterins. With the stock bacterin my losses ran from 16 to 35 per cent, whether due to the fact that it was stock bacterin, I do not know.

I have been using this autogenous bacterin for something like three years. I was having trouble with serum and virus in cases where I was certain the work was done properly. These losses ran sometimes as high as 25 per cent and occurred in animals that had been treated for four months. I first ob-

served the trouble about the time Dr. Kinsley's book on "Swine Diseases" was first published, and I was greatly interested in it, having done a little experimental work from the standpoint of the laboratory man, and I began making the bacterins directly from the herd, putting my whole time in on the work. On the strength of former experiments, I got permission to experiment on one of the farms, on 1,600 pure-bred Chester Whites. At that time, I used the autogenous bacterins almost exclusively. The stock bacterins had been used in a limited way, and from results I have seen recently, I believe stock bacterins are doing wonderful work in the control of certain diseases. Even when closely observed, and it requires close observation in this work, mixed infection can easily be mistaken for something else. I do not believe there is a man in the United States that has done cholera work that has not made a mistake in diagnosis at some time or other, and there are a great many going to be made and a great many are being made this year. I had, in a herd of between 4,500 and 5,000, hogs that came down with this trouble in February. These pigs were the spring farrow of last year, immune hogs weighing about 200 pounds. I had the hog man pick out 10 per cent and give them 10 c.c. of virus, and there was no reaction.

These hogs broke out in February with this mixed infection. I called Dr. Morin over to observe the work with me, and as I happened to have some autogenous bacterin on hand, we gave it to the hogs at once. In one herd of 200-pound gilts, 820 head were seen on Friday and proclaimed the brightest bunch of hogs ever seen. They were not quite six months old, weighing 200 pounds and a little better, but not yet quite up to the weight at which we sell. I saw them again on Saturday, but did not see them on Sunday. On Monday when I saw them there were just 200 of them that could be driven out of their nests. I gave the other 620 autogenous bacterins. I lost thirteen of the 620. The same conditions broke out in sows two years old and in little pigs a week to ten days old. I believe I had 4,000 cases of mixed infection on that farm at one time. In those proving fatal, death occurred within a few hours for the most part; some lingered a few days. Beginning with the little pigs, I vaccinated the entire lot, even the older hogs weighing 650 to 700 pounds. I could not keep an exact count with so many to handle. Some died before I came and were buried before I could see them. Altogether we did not lose over 4 per cent. I then began to divide the hogs into bunches of 300 to 500, dividing according to sizes. We then began the treatment with the older hogs. It was the first time I had ever seen this infection in aged sows.

DR. A. T. PETERS:—I have never had any experience with stock bacterins that has been satisfactory. I remember one herd where the stock bacterins were used and we ran out of bacterins and had to wait eight or nine days. In the meantime the herd straightened up and the owner did not have the remainder of the herd vaccinated. Had I had the opportunity to use the bacterin on the entire herd I would have given the bacterin the credit for the recovery, but having 65 head that had had no bacterin, for which I had to send to Kansas City, and coming back nine or ten days later and finding the herd cleaned up, I did not vaccinate them. The 65 that were not vaccinated seemed perfectly well and there has been no trouble in the herd since that time.

Two-day old calf with one two-and-a-half-pound testicle. The scrotum was thought by the owner to enclose a "rupture," but operation revealed simply the two testicles—one normal, the other with apparently normal tissues, much hypertrophied and partly synthetically enlarged.—C. B. KNOWLES, Sioux City, Iowa.

SYMPTOMS OF TETANUS FOLLOW ACUTE INDIGESTION

The following report shows where I "fell down, slipped a cog, reversed," and then speeded ahead when I least expected.

Recently I was called to see an 8-year-old mare, which had been in pasture with her colt until two days previous, when she was taken in and the colt weaned. On the morning of my visit, she had been hitched to a bundle wagon and driven to a thrashing machine about a mile away. When hitching her up, the owner noticed that she was a trifle stiff; slower than usual; and elevated her upper lip. But he attributed this to weaning the colt. An hour later she laid down and I was called. I found her lying in a stall, and it was difficult to get her up. She was stiff and sore all over, and the symptoms indicated laminitis. The muscles of the forearm were hard and stood out rather prominently, suggesting azoturia. Catheretization proved negative. The muscles of the face and neck were rigid; ears erect and stiff; nostrils trumpet-shaped; lips drawn back—a typical tetanus expression, minus history, spasms, protrusion of the membrana nictitans, and other symptoms. The temperature was 102°, pulse 60, respiration 45; peristalsis practically nil.

I was confronted with a combination of symptoms that I had never seen, heard of, or read of before. I treated the animal for indigestion, but it was difficult to keep her up, and she was much distressed when standing, lying down in ten to twenty seconds. When down she was quiet, never attempting to roll. At the end of three hours there was no apparent improvement. I suggested consultation and went home to dinner. On my return we helped her up and presto change she stood quiet; peristalsis was normal, and we thought all was well, but on going to her head we found that during the lapse of an hour, her jaws had set as tight as any case of tetanus I had ever seen. Lockjaw she had without a doubt, but I was certain it was not tetanus. I felt whipped and ready to quit, but thanks to my assistant, Dr. Mylan, while I was away for a few minutes he had busied himself massaging the nose and lips, and on returning a decided improvement could be noted. On the theory that "if a little is good, more is better," we continued to massage strenuously, and in a half hour she could open her mouth a trifle. At three o'clock we left advising the use of hot fomentations.

About seven that evening, just after consulting Hutyra and Marek, who made our case clear (they say tetanus symptoms are sometimes observed in painful intestinal diseases, that Hoffman observed this repeatedly in a horse infested with ascaris, recovery following the expulsion of the worms), our client drove up and reported that he had hitched his mare up at five o'clock and driven her home, apparently as well as ever. Needless to say, I will be more at ease if I ever have occasion to treat a similar case.

Remsen, Ia. THEO. S. LIST.

MULE AND HORSE TWINS

In the *Kansas University Science Bulletin,* Vol. X, No. 15, appeared a report of the investigations made by Professor W. R. B. Robertson, of the University of Kansas, concerning the birth of a mule and a horse as twins, said to have taken place on the farm of George E. Loy, Barnard, Kansas, June 9, 1913. From the testimony of the owner, his family and neighbors, that of the photographer who took pictures of the animals, and from the author's own observations the following facts were deduced:

In 1912, the dam, ten minutes before being bred to an ass stallion, had been bred to a young three-year-old stallion, fertilization in such cases being expected from the second sire. In this instance, however, twins resulted, one a male horse, the other a female mule. The case was of sufficient interest, fortunately, to be photographed by the local photographer, and these photographs

[1]Jour. Am. Chem. Soc. 40: 817-822.

are reproduced in the bulletin containing the report.

The history of the mare, herself a twin, showed that in the nine times she had foaled she had given birth to twins (mules) on two other occasions, the fifth and ninth times. In addition, her second foal had given birth to twins, and her own sister had also produced twins, showing that the trait of twinning was present in the family and had been handed down from mother to daughter through three generations. That this twinning was of the dizygotic type is, the author believes, proved by the different colors and marking in all of the cases and in two cases by differing sexes. In the case of the mule and horse twins, though differing in sex and marking, both were bay, one a light bay (mule), the other darker bay (horse).

In the case under consideration, the presence of the mule fetus seemed in no way to affect the development of the horse fetus, no abnormal characters being apparent in the horse colt.

The author concludes that the occurrence of a mule and horse as twins might be termed a case of superfecundation rather than superfetation, since fertilization of both could have taken place only at one period of heat. This is believed to be the case, as only one breeding to each sire occurred, and these breedings at ten-minute intervals.

Mumford, in his text "The Breeding of Animals," gives seven examples of what he terms superfetation. Six of these resulted in twin colts, one of which was a mule, the other a horse, but they resulted from fecundation at a second or later period of heat. One of the colts, accordingly, was usually smaller or less well developed than the other. The number of cases cited by Mumford shows that the occurrence of horse and mule twins is not such a rare occurrence as is generally believed. The author says: "The facts indicate that such twins may be produced, not only by fertilization during pregnancy at a recurring period of heat, as Mumford's cases appeared to be, but also as a result of the appearance of two ova in the uterus at once."

Newman in his book "The Biology of Twins," says: "At the present time, I have no reliable evidence of twinning in horses, but it is highly probable that this group offers no exception to the general rule that all mammals normally producing but a single offspring at a birth may have twins."

COMPLICATIONS OF INFLUENZA

In the September issue of the Journal I noted an article, "A Case for Autopsy," that looks very clear to me and the description is similar to that which I gave in my paper at the Missouri Valley Veterinary Convention on "Some of the Complications of Influenza," under "Endocarditis." So many cases similar to those described in the Journal have come under my observation during the past two or three years that they do not give me much difficulty in diagnosing them. In the case reported there was undoubtedly an endocarditis present, and thrombus formation had probably advanced to a considerable degree. The stiffness in these cases is due to a laminitis brought on by the septicemic condition of the blood, resulting in gravitation to the dependent parts. The straining may be due to a catarrhal cystitis, the thickened walls producing a sensation of fullness. The appetite is poor or entirely lacking, depending upon the extent to which the stomach or intestines, or both, are involved. The urine usually becomes ropy as the disease progresses as it contains more albumin.

In regard to azoturia I might say that I am certain it is a sequel to influenza and a result of the conditions brought about by influenza. I have had several such cases that yielded to a couple of intravenous injections of anti-influenza serum in less time than I have ever had them recover under the old medicinal treatments. The giving of the serum was a sort of experiment as I had suspected influenza in the animals. All other medicines, except urotropin, were withheld, and the speedy and complete recoveries were certainly a surprise to me.

I discontinued the use of hot applications some time ago, as I believe they are contra-indicated. I cannot understand why we should stimulate the congestion of a region already loaded with toxins and weakened from their effects. I believe it is better to hasten the elimination of these products and then stimulate repair at a stage when the blood is not loaded with such destructive products. Let us be more scientific in administering treatment to our dumb brutes. Eliminate the symptomatic treatment and treat the cause and you can expect better results.

Williams Ia. W. P. BOSSENBERGER.

INTERESTING CASE OF PARASITIC DISEASE.

Subject.—A valuable thoroughbred yearling colt.

History.—As a foal the animal was in moderate condition, but beyond treatment for a bursal distension in the hollow of the heel of the off-hind and also of the back of the fetlock, said to have been the result of an accident, veterinary attendance was not required. During the spring of 1918 he lost condition, and the pasture was then changed. After four months he got into excellent condition, but while at grass he received a slight wound on the anterior surface of the near fore leg, for which I treated him on three occasions. On my last visit I found that the wound was practically healed. The colt was seen by me about 11 a. m. of that date, and was so apparently well that it was difficult to catch him. The attendant saw him at 7 p. m. on same date, and he seemed quite well, but at 8 p. m. the colt was found dead in the field.

Autopsy.—As death occurred on a Saturday evening it was not possible to hold a postmortem until the following Monday afternoon, and, owing to this, decomposition of the body had commenced and interfered considerably with the procedure.

The intestines were enormously distended with gas, and postmortem rupture of the diaphragm had occurred. The articular head of the femur (off side) was found separated from the bone; this was evidently due to the rough methods of the knacker in loading and unloading the carcass.

Nothing abnormal could be detected in any of the abdominal organs.

On examining the thorax, the heart was found very pale in color, and its cavities were empty. Examination of the aortic semilunar valve showed that in the vicinity of one of the sinuses of Valsalva, what appeared to be a large vegetation or warty-looking growth was present, which was in contact with the corresponding segment of the valve. The tunica intima was eroded at this point. A short distance from this an extensive eroded and inflamed area was found in the common aorta, covered by several prominent vegetations, and by careful examination a number of parasites were discovered burrowing into the wall of the vessel. These parasites conformed to the description of *strongylus vulgaris*. At the termination of the posterior aorta, close to its quadrifurcation, similar lesions were found, and also a number of parasites.

The first point which appeals to the clinician in the above case is to ascertain the cause of death. Owing to the condition of the carcass it was difficult to decide as to the presence of thrombi, and I must confess that I did not examine the coronary arteries. Therefore it is but theorising to suggest that occlusion or thrombosis of one of the coronary arteries was the cause of death. The close proximity of the vegetation or warty-looking growth to one of the segments of the semilunar valve would lead one to express surprise how the valve could have performed its functions, while the lesion also involving one of the sinuses of Valsalva would suggest that the circulation in one of the coronary arteries would be interfered with, provided, of course, that the sinus involved was one from which the coronary artery sprung.

The next point which strikes the clinician is the medico-legal aspect of such a case. Here was an animal in perfect condition and to all appearances healthy. Had I examined him for insurance or castration on the date of my last visit to him, I most certainly would have certified him as sound and healthy. Further, the chances are that he would

have stood the test of an ordinary examination as to soundness on that date, as it is not usual to test the wind of yearlings with the same degree of thoroughness as would be adopted in the case of two-year-olds and upwards. Without doubt much trouble would have arisen when the animal was found dead on the same evening, and the post-mortem results would not tend to soothe the feelings of an insurance company or of a purchaser.

However, it is well to let the public be aware of the fact that latent diseases do occur in horses, and that no blame should be attached to veterinary surgeons when they are unable to detect the presence of such affections.—*The Veterinary News,* London.

E. WALLIS HOARE, F.R.C.V.S.
Cork, Ireland.

FORAGE POISONING? RESPONDS TO MILK FEVER TREATMENT

I was recently called to see a sick cow which the owner said had been running in a milo maize field all day, and had come home sick. She was staggering about like a drunk man, and when down grunted at every breath.

My diagnosis was impaction or overloaded rumen, the staggering being due to intoxication created by the juice of the frost-bitten milo maize. I gave her two pounds of magnesium sulphate and left. The next morning the owner reported that the cow was still down, but asleep, with her head resting on her side. I advised him to let her alone and call me at noon.

At noon he asked me to come, saying that she was in the same position —could not get up and would not notice anything. When I arrived it looked to me like a typical case of parturient paresis, but as the calf was six months old, I concluded the condition was due to auto-intoxication. Temperature 1023/5°. I decided to inflate the udder, against the owner's protest, who thought it foolish, when the cow was so very sick. However, it was done, and—presto, change—in ten minutes she raised her head and began to look around, and in twenty-five minutes more she was on her feet and ready to take nourishment.

Was my diagnosis made on my first visit correct and was my conclusion right on my last visit? If not, what was the trouble with the cow? Will someone answer?—C. L. I., Tex.

HE CAME ACROSS

While traveling over the state of Georgia and working with the county agricultural agents, I have had ample opportunity to observe the calibre of their work. Many are doing good work, while some are trying to practice veterinary medicine and are treating everything from "hollow-tail and hollow-horn" to all cases of indigestion. Some even introduce themselves as Doctor. The veterinarians are doing well and are doing good work.

It might be interesting to the Journal readers to know that there are 113 counties in Georgia without veterinarians. Many of these counties would support a good man, while some would not.

While passing along a country road in Tolbert county a few days ago, I observed a crowd of farmers around a sick mule. The mule, suffering from intestinal flatulence, had been treated by several of the farmers, of course in their usual way. After relieving the animal by inserting a trocar and canula, an M. D. appeared who had been called. This M. D., who had been doing quite a bit of veterinary work, charged the farmer $5.00 for his trip, and my work, as I am with the state and government, was gratis. The farmer called me that night and then the next morning and he was very much elated over the fact that he had a government man to administer to his sick animal, free of charge, and the animal recover. This farmer had never given anything to the Red Cross, had not bought any Liberty Bonds or Thrift Stamps, so I advised the County Agent to ask him for a donation to the Red Cross. Upon doing so, the farmer refused and said that he needed the money to make a crop, but a few days before he

had purchased a fine large automobile. I listened to the conversation for a few minutes and then I handed him a few good words not found in the Sunday school books. After the government doctoring his mule free of charge, visiting the mule a second time without charge, and then he refusing to donate to the Red Cross was more than I could stand. Having been reared on a plantation with negroes, I have a language of my own, and I gave the farmer five hours to make a liberal donation. At the appointed time he gave the County Agent $25.00.

This sort of occurrence is common in many of the rural districts—no patriotism, medical doctors trying to vaccinate hogs and practice, County Agents practicing—and still the veterinarians are doing well.

E. S. BRASHIER,
Athens, Ga. Insp. in Charge.

INFECTION FROM MUD HOLES

I was recently called to see some sick pigs on a farm near Danville, Ill. In the pig lots were a number of mud holes in which about 150 March pigs were wallowing. The history showed that the pigs had been losing weight and some had died. The deaths had been attributed to cholera by two veterinarians. The remaining hogs had been vaccinated but still some died. After making two post-mortem examinations, I made a diagnosis of necrotic enteritis. After being given treatment consisting of one per cent solution of copper sulphate, no more deaths occurred.

In the feed yard at this farm were about forty or fifty steers and heifers, about two years old, with large enlargements about the size of a fist or larger in the lower part of the vulva and around the tail head. The heifers showed lesions in the udder also. These mud holes, in my estimation, are the worst disease producers one can have around hog lots.

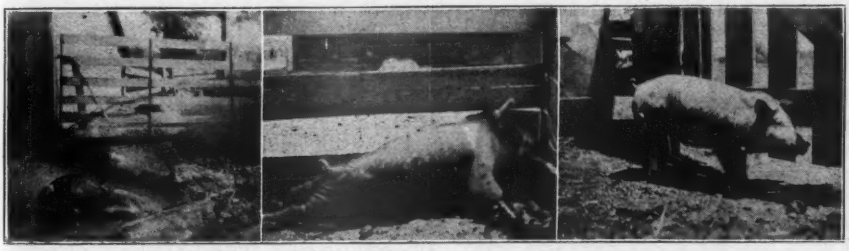
At another farm I visited a number of hogs were suffering from tetanus. According to the owner these pigs had been castrated two weeks previous to the time we were called to see them. One had died and three others showed symptoms. Eleven others which were perceptibly ill were given antitoxin. No more deaths occurred.

Chicago, Ill. W. G. KEEHN.

MENINGITIS INDICATED

We are having an outbreak of meningitis in cattle around Sioux City, which is probably due to hemorrhagic septicemia. Otherwise gentle cattle will chase chickens and attempt to bunt or hook a waving weed or trailing rope. It causes "locoed" staid old cows to perform most ludicrous actions. High fever, injected conjunctiva and rolling eyeballs, straining to defecate, intermittent wild actions, paroxysms, paralysis, coma and death occurring at any stage, after presenting most of the commonly accepted symptoms of rabies, obtains on some farms; while on others, the staggering, uncertain gait, followed by progressive paralysis with the "S" in the neck, and death, simulate milk fever.

At present we are vaccinating all ani-



At left: A mud hole on a farm on which the hogs were affected with enteritis. Center: Tetanus in a pig. The spasms were so violent that this pig could not stand alone. It was destroyed later. At right: Tetanus pig. Could stand alone but spasms were so great he could scarcely walk.

mals in the vicinity against hemorrhagic septicemia, and advising that it be done in all infected neighborhoods, as all the animals I have posted showed meningitis, lung and pleura infection, reddened glands, and considerable icterus and petechiae, with "impaction of the manifold."

Many cases fail to show petechiae in or upon the heart. We are advising owners to repeat the vaccination upon reappearance of the disease, or at least every six months until a perfect immunizing agent is found. In this connection, I always call attention to the carrying of the disease by dogs and pigeons, and advise a semi-quarantine of infected premises. Coyotes also assist in the spread of this disease as well as in rabies. C. B. KNOWLES.

Sioux City, Ia.

COCAINE IN HEAT PROSTRATION

I was recently called to see a case of heat prostration in a horse belonging to a state road contractor.

The horse came in from road work Aug. 8, at 5 p. m., after an extremely hot day. After being unhitched, he laid down before he could be put in the barn, and was unable to rise; body very hot; pulse and breathing rapid; mucous membrane cyanotic. Upon taking the temperature, I was very much surprised to find it 110.6° (the average thermometer only registers to 110°). Thinking there might be some mistake, I made a test temperature with the same result. An unfavorable prognosis was given.

I gave the animal three grains of cocaine hypodermically, and in about ten minutes he struggled to his feet, walking around blindly and wabbly, but he soon fell over again. He was held down and cold water showered over him, bucketful after bucketful; later the hose was used. Small doses of nux vomica and aromatic spirits of ammonia in a little water were given every half hour. By eight o'clock the animal was able to get up and walk into the stable and eat a little hay, and at nine o'clock his temperature was 101.6°.

The animal was fed lightly, and the tonic continued the next day every three hours. After resting four days he was able to take his place in the harness and has been working every day since. No complications have arisen and the animal seems to be as well as ever. This is the highest temperature I have taken in my experience.

Bellefonte, Pa. S. M. NISSLEY.

DISEASES OF FOWL AND FISH

The poultry stock of this country represents no inconsiderable amount of capital value, and the revenue derived from fish is very large. It seems likely that before we are through with the difficult times here that we shall have to make heavy calls on creatures that swim and fly. It has been suggested that a good store of food lies at hand in the eggs of sea-fowl, and that this source may be tapped almost without limit. Those who have eaten the eggs of the water-hen, or plover, know how palatable they are, and there is little doubt that the eggs of the marine and aquatic birds that surround our coasts will come in very acceptably if an organized plan for collecting and distributing them is devised.

Considering the importance of fish and fowl it only accentuates the statement recently made by a discerning lady—"there is a big vein of laziness in the Britisher's disposition"—that little research has been made in the diseases of these creatures, and that as veterinarians we are not as familiar with their complaints as we should be. Both furnish means of quickly, easily, and cheaply increasing the food supply of the country. The increased breeding of ducks and geese will also help. Feeding problems with regard to them must be overcome by intelligence and foresight and it is rather a sign of muddle and inefficiency that any difficulty occurs in the matter.

Recently an inquiry was made about aspergillosis in birds, and not long ago a gentleman stated that "nobody knew anything about swine fever." In the one case it appears as if investigation is in its infancy, whilst in the other it looks

as if "much study is only a weariness of the flesh."

Many diseases of fish and fowl will pay for investigation. Furunculosis of fish is a disease which causes considerable loss. It is characterized by hemorrhagic inflammation of the bowels and bleeding in different organs, especially in the muscular tissue and spots and ulcerations in the skin. In closed waters one way of destroying a considerable number of the bacteria which cause the spread of the disease is by the use of potassium permanganate in dilute solution which does not injure the fish. Fishing out and selling the sound stock is another way of dealing with the malady. We do not think it has been conclusively proved that furunculous fish do not transmit disease to man, and it may be worth while investigating fish supply as a possible source of some of the crops of small boils that not a few men who have been in active service have suffered from. In any case a different view of the likelihood and possibility of infection or contagion from fish to animal may be taken from that from fish to man. We ourselves have seen a peculiar disease in ponies characterized by crops of nasal, oral ecchymoses and pustules and perineal pustules, and raised discharging patches on the skin; and in all the cases the ponies were engaged in carting fish and frequently licked fishy surroundings and damp fish carts. They entered yards where fish were gutted and cleaned.

Aspergillosis of birds is difficult to cure, but now and then birds recover by applying flowers of sulphur or tincture of iodin to the patches that can be reached, and letting the fowls inhale the vapors of tar water or turpentine in a closed room.

Black head, white comb, roup, coccidiosis, white diarrhea of chicks, fowl cholera, and chicken pox are all infectious diseases which need further investigation and research work.

The prevention of disease, however, is always more important than its treatment where poultry are concerned. The veterinarian must not only be able to diagnose and suggest remedies in diseases of poultry, but to enlighten the owner as to the best way to prevent infectious complaints. Good eggs from healthy flocks, clean incubators, small flocks, sound ground, cleanliness, and disinfection, clean food and water are all of importance in the rearing of healthy profitable fowls.—Editorial by G. MAYALL, M. R. C. V. S., in the *Veterinary Journal.*

AZOTURIA FATAL IN CITY HORSES

I have just read an article on "Azoturia," by Dr. C. C. Robinson, of Gate, Okla., on page 91 of the February number, referring to the comparative severity of attacks in city and country. He asserts that practitioners who state that city cases are more severe than country, have never had any country experience. He also claims that the profession is at a loss to satisfy either themselves or their clients as to the cause of azoturia. Reading between the lines, one may assume that the doctor in question is very conscientious but downhearted with his azoturia patients.

I have nothing new to offer except to advise Robinson to cheer up as he is not alone in his grief.

The following comments may give the impression that I consider myself the sole possessor of a specific, but this I wish to correct at the start, by stating emphatically that I have no such delusions, but may say that I consider my treatment as good as any other, and the best that I have so far found.

Personally, I am familiar with azoturia in both city and country horses, and at one time was employed as an assistant to one of the most prominent and eminent veterinarians on this continent, who at that time enjoyed the largest veterinary practice in the world, and needless to say, I was thrown in contact with numberless cases of azoturia.

During the past ten years my practice has been mixed, including both city and country, the latter predominating.

My city practice taught me to regard azoturia and its prognosis in the gravest light, and as the greatest enemy to

an ambitious young practitioner anxious to establish a creditable reputation.

I have employed (and observed others) every known remedy in all the official pharmacopeias in city practice, and without exaggeration assert that the mortality was more than 95 per cent. Our fancy treatments finally dwindled down to: aloes ball, turpentine, catheter, hot applications over the region of the loin, and where excitement and pain seemed intense, the administration of some one or more of the ordinary narcotics, but as previously stated, the mortality would in no way be reduced.

Finally, if the patient survived until the third day after the attack, and could then with help stand up, if only for a few seconds, the prognosis would be favorable and the conclusion, in my experience, justified the optimism.

But if the patient made no effort and could not be induced to stand up on or after the third day, my advice would be to "acquaint all relatives and call in the undertaker", because "Mr. Hoss would surely die."

In the country the conditions are absolutely reversed, and there I now look upon azoturia and its prognosis favorably.

I have treated at least one hundred cases, and recall but two cases that succumbed, and one of them was really a city case, a Percheron stallion shipped to a country point and attacked while on the way from the station to his future home, a distance of four miles.

This being a $3,500-patient he received the most careful attention, but the case ran the usual course of a city case and died.

The other case which died was a purely country one, and I believe I helped to kill him in this way. He was going through the ordinary course, was being treated in the usual way, and I felt no alarm, but I thought I might possibly hasten the treatment by the use of adrenalin chloride.

Knowing that the absorption of this drug was very indefinite when used subcutaneously, I decided to inject some into the jugular.

The horse got up on the third day, and was discharged the next as completely recovered, and save for a few abrasions on the head, shoulder, and hip, he showed no signs of having been sick. On the fifth day he was turned out in the yard to drink at the trough. He kicked and played and then suddenly dropped dead. My contention is that the adrenalin caused the formation of a clot, which in the form of an embolism lodged in some vital part of the circulation, and the excitement hastened the climax.

As to the cause of azoturia, I can safely say that one factor of the history has always been present, i.e. enforced idleness to a horse accustomed to considerable activity.

The season and climate are of minor importance, as it occurs both in summer and winter, but the latter is more favorable, due no doubt to lessened activity of the skin glands necessary for elimination.

My treatment is a great dark secret, consisting of aloes and calomel ball, capsules of turpentine, hot applications over the affected area, use of catheter, large heavily bedded stall, and the patient turned from one side to the other frequently.

I may also mention another point which I consider of the utmost importance, i.e., to have a man continually in attendance, so that should the patient show any great desire to rise, he may be given every help and encouragmeent to do so, for I have found that a horse can stand if willing and able, and given the proper help at the right time, but if such a horse is able and unwilling to at least try, I am satisfied that the whole German army could not force him to do so; and in such cases slings are absolutely worthless.

This discourse may seem empirical to our modern medicos, and I am not entirely ignorant of other more aristocratic treatments, but when it is necessary to pay the grocer, war taxes, and keep the home fires burning, I

find the little word "results" fills all wants, and the interpretation of the word "results" is the word "money" in the Canadian dialect, at any rate, hence, so long as my treatment of azoturia is successful, I am certainly not going to cast the old broom aside.

In conclusion, I might say that the intensity of an attack of azoturia in country horses is far less severe than in city horses, and I really enjoy treating the former class, but I would rather be an Englishman in Berlin than to be called to a case of azoturia in the city.

H. S. CAWSEY, M. D. V.

Regina, Sask., Can.

LOBELIN

The U. S. Pharmacopeia recognizes Lobelia inflata (*Campanulaceae*), also a fluid extract and tincture of the leaves and tops but has not yet added lobelin—$C_{18}H_{23}NO_2$. This alkaloid is used as the sulphate only. It is readily soluble.

Pharmacology. Lobelin sulphate is one of the active principles most recently added to veterinary medicine, and while its field is limited its therapeutic possibilities are such as as to induce more extended use and study.

For years lobelia has been depended upon by the eclectics who call it "the vegetable antitoxin." It is claimed by some that lobelin is so rapid an emetic that it is impossible to poison with it. The principal action is an an antispasmodic and motor depressant. The primary depressant effect is followed by a stimulating action or more properly a near-return to normal, probably the result partly of increased oxidation or elimination of toxins. Lobelia stimulates the absorbents to carry off pathological debris, a peculiar property held by only a few drugs, e. g., veratrin, pilocarpin and aconitin.

Therapeutics. The above shows that lobelin sulphate is indicated for such pathological conditions as tetanus, azoturia and emphysema. For the relief of the hyperexcited nerve-trunks and peripheral vagi in tetanus, one can depend on lobelin associated, of course, with proper doses of the biologic tetanus antitoxin. By overcoming the muscular convulsions (spasm) and the nerve tension and irritation from the presence of the toxin the animal is put in the best possible position for the reparative processes to get in their work. This is the function of lobelin.

Administration. One-twentieth of a grain of lobelin sulphate is the average dose for a 1,000-pound animal. In mild cases it should be given hypodermically two or three times daily; in severe cases, every two hours or even at hourly intervals for relief from the spasm. In emphysema, one dose only, one-twentieth grain to one-tenth grain, should give prompt relief, paving the way for further indicated medicinal measures which apparently act better as a result of the preliminary lobelin treatment.

F. B. KIRBY.

BLACK TONGUE IN DOGS AN AMEBIC DYSENTERY

I have read with much interest the various articles in the JOURNAL regarding "black tongue." Each writer has a different opinion as to the cause and treatment, although each describes similar symptoms; some discuss it under a different name and do not seem to recognize it as "black tongue." In most of the textbooks it is classed as different forms of stomatitis, gastro-enteritis, etc. I have seen no better description of the disease than that given by Dr. W. G. Browning, of La Grange, Ga., on page 113 of the February Journal, 1917.

With so many different opinions as to cause and treatment, I feel that I cannot be any further off the track than some other members of the profession who have made a study of the disease. In my opinion, this disease is due to an amebia, and is nothing more nor less than the amebic dysentery so common in the tropics. The amebia, as described by Coplin in his work, can be found in every instance. The postmortem lesions in the human as described by various authors on amebic dysentery compare very favorably with those found in the body of a dog which has died of black tongue. The pathology in Coplin's book is identical. The animals if taken in time will yield to the

treatment for amebic dysentery as described in textbooks on human medicine.

Owing to my limited experience, lack of laboratory facilities, and lack of knowledge as to carrying out laboratory work, I have been unable to secure satisfactory results along these lines. I hope to be able to learn through your columns of experiments carried out along these lines by experts, which I believe would be of great assistance in combating this disease so much dreaded by veterinarians and dog lovers in the South.

The treatment which I have outlined in accordance with the treatment used for amebic dysentery in the human by the M. D.'s, has been very satisfactory in cases which I could get in touch with at the onset, but cases which have a few days' start, are very discouraging. The treatment consists of:

℞

Santonin

Calomel aa gr. XXX

M et F. Cap. No. 15.

Sig. One capsule every two hours for 24 hours.

This dose is amply sufficient for an ordinary size setter bird dog. At the beginning of treatment, I give one sterile capsule, one cc. of emetine hydrochloride solution. This is repeated throughout the treatment. Sugar-coated tablets of calcium sulphide and echinacea, two grains, every six hours, or F. E. ipecac, 20 minims in wine or brandy, repeated every four hours. In my hospital I use only the sterile solution of emetine and give a few doses of santonin and calomel. This line of treatment gives very satisfactory results if the cases are not advanced. I believe advanced cases will die in spite of any treatment.

These comments from my limited experience are not presented as advancing anything new in the way of treatment. I give my findings only in the hope that some one competent to carry on such investigations will continue them and be successful in unraveling the mystery of the etiology of black tongue in dogs.

CHAS. W. FISHER, D. V. M.

Danville, Ky.

The Woman's Auxiliary

As mentioned elsewhere, the organization known as the Woman's Auxiliary to the A. V. M. A., was splendily represented at the Philadelphia meeting. The officers chosen to represent the organization for the ensuing year are: President, Mrs. W. Horace Hoskins, New York City: Vice President, Mrs. H. Jensen, Kansas City, Mo.; Rec. Secretary, Mrs. Charles E. Cotton, Minneapolis, Minn.; Cor. Secretary, Mrs. Lockhart, Kansas City, Mo.

The Constitution and By-Laws were adopted in which the purpose of the organization was set forth as follows:

"The object of the association is to give necessary financial assistance to the family of any veterinarian engaged in war work if his life has been forfeited in pursuance of such work or if he has been temporarily or permanently disabled."

The sisters, wife, or daughters of a veterinarian who is eligible to membership in the A. V. M. A. is eligible to membership in the Woman's Auxiliary.

We bespeak for the new organization a very useful and interesting future.

Toxication of Veronal

The *British Medical Journal*[1] notes two cases of poisoning from veronal. In one case General Sir Beauchamp Duff suffered from insomnia and was in the habit of using veronal. The jury returned a verdict that death was due to narcotic poison, self-administered for the purpose of securing sleep. According to W. H. Wilcox, 15 grains was the smallest dose which had proved fatal. At the trial of an insurance case it was stated that five grains had produced a fatal result. Veronal, according to Dr. Wilcox, may be regarded as a contributory cause of the death of a patient in a bad state of health, rather than the actual cause. Veronal produces a cer- much as morphine or other drugs. According to Sir James MacKenzie there is no such thing as the veronal habit. Fifteen grains, that is to say, three of the small tablets ordinarily sold, may produce a fatal result. In Great Britain all veronal sold must be entered in the poison book.

Fifty-fifth Annual Meeting of the American Veterinary Medical Association

NO description of the Philadelphia meeting of the A. V. M. A. would be adequate without mention of the delightful weather and pleasant surroundings of the meeting place, the factors that contributed perhaps more than any other one thing to the enjoyment of the occasion. The weather was delightfully cool throughout the meeting and the arrangements of the local committee for the convenience and accommodation of those attending the meeting were well nigh perfect. As an occasion of enjoyment for the members and visitors who attended, the Philadelphia meeting has probably never been equaled. In attendance, in program rendered, in its educational value, and in the importance of business matters and matters of policy, the meeting can scarcely be said to have been up to the standard of any of the meetings of this association of the past decade. As was forecasted in our August issue, the attendance was light, the total registration being around 500, or only about one-third of the attendance at recent meetings in New York, Detroit and Kansas City. The exceedingly high cost of travel was no doubt a contributing factor in keeping down the attendance, but considering attendance at some of the recent state meetings under similar conditions of travel, it cannot be denied that a lack of publicity was an important factor in bringing about the light attendance. While the date of the meeting and a tentative program had been announced in advance and every member and most other veterinarians doubtless knew the time and place of the meeting, no attendance-boosting publicity was given this meeting, nothing calculated to arouse the enthusiasm of members was published or distributed in advance of the meeting. Even the official program, splendid in every particular, and alone good for an attendance of two or three hundred, was not mailed until a few days before the meeting and probably reached no one in time to effect his decision to attend or not to attend.

The number of ladies who attended the meeting was unusually large and the entertainment furnished them was most excellent. In this respect the meeting undoubtedly excelled any predecessor.

The program rendered was easily up to the high standard usual at A. V. M. A. meetings, but in quantity it was light, and something like one-third of the papers listed were not rendered, a condition most unusual at A. V. M. A. meetings. Separate section meetings were held on only one half day; the attendance at these sections was more than disappointing being thirty-five in the practice section, thirty-three in the section on sanitary science, and eighteen in the section on college faculties and examining boards. At only one session of the meeting, the war session, held the forenoon of the second day, was the attendance greater than the attendance at the recent summer meeting of the Illinois State Veterinary Medical Association at Champaign, or the annual meeting of the Missouri Valley Veterinary Association at Omaha, the reason being that the pleasant hotel surroundings and the superior attractions of Philadelphia kept a large number of those in attendance constantly out of the meeting room in the enjoyment of matters of social or historic interest.

Unusual interst was shown in the election of officers and the vote was undoubtedly larger, in proportion to those in attendance, than it has been for many years. The total vote for president was 284, of which Dr. V. A. Moore of Ithaca, N. Y., received 184 votes and was declared elected. The total vote for secretary was 256, of which Dr. N. S. Mayo of Chicago received 163, and was declared elected. Dr. Frank H. Schneider of Philadelphia declined renomination for treasurer and Dr. M. Jacobs, state veterinarian of Tennessee, was unanimously elected.

More Than 1,000 Elected to Membership

The most unusual feature of the meeting was the large number of applica-

tions for membership, nearly all of whom were elected, the total number added to the membership roll at the meeting being slightly over 1,000, or nearly twice the number elected to membership at Kansas City, the record until that time. Of the applicants, rather above five hundred were employes of the B. A. I., and approximately three hundred were veterinarians in army service, leaving rather less than two hundred as the total number of applications from practitioners, a showing highly creditable to the B. A. I. and the Veterinary Corps, but far from commendable for veterinary practitioners.

The president's annual address was extensive, reviewing in detail the achievements of the profession during the year, paying a tribute to what has been accomplished in military matters and in guarding the live-stock industry during the present crisis. The president made a strong plea for additional contributions to the Relief Fund, and said that he had present information that the need for this fund was, and would continue for some time to be most urgent and that the fund could scarcely be too large. He spoke of the veterinarian's opportunity for helping the live-stock industry and the entire population of the allied world by improving methods of care and feeding of animals, and urged veterinarians to the patriotic duty of carrying on a continuous campaign of education among their clients for better and more economic feeding and for hygienic and sanitary methods that would prevent large losses of animals from disease, exposure and accident. He spoke of the urgent need for better instruction in veterinary colleges, particularly in matters pertaining to military practice, buying and transportation of horses, etc. He spoke of the discovery and wide adoption of Dakin's solution in the treatment of wounds in animals and the splendid work of Dr. Merillat during the year on "Fistula and Poll-Evil;" of the discoveries of the cause of milk sickness, and of other forage poisoning.

The president mentioned the loss of several prominent members during the year and paid high tribute to Drs. Melvin, Liautard, and Stewart, the latter being president of the association when he (Torrance) joined.

Six Executive Board Districts Now

In the first report of the executive committee, it was recommended that the second executive board district be divided to constitute the second and third. That the third district become the fourth, the fourth the fifth, and the fifth the sixth. The new district comprises the states of Ohio, Wisconsin, Michigan, Indiana and Illinois. The remainder of the old second district being continued as the second district. The executive board recommended that $500.00 be given to the Women's Auxiliary Relief Committee, and $3,000 to $5,000 be devoted to the purchase of bonds of the United States and Canada.

The Section on General Practice

As Dr. T. H. Ferguson, of Wisconsin, chairman of the section on general practice, was not present at the meeting, Dr. R. A. Cooley of Cleveland, Ohio, was appointed in his stead.

The paper by Dr. S. A. Goldberg, of Ithaca, N. Y., on "Certain Aspects of the Pathology of Spavin" was brief but very interesting. Dr. Goldberg expressed it as his opinion that spavin is usually due to infection and that a very considerable proportion of this infection is due to umbilical infection contracted at the time or soon after birth. He stated that his investigations had shown that spavin is at least as common in the ox as in the horse.

In discussing this paper, Dr. Geo. H. Berns of Brooklyn, said that for forty years he had been under the impression that spavins were always of traumatic origin, but that Dr. Goldberg's research and his illustrations demonstrated to his (Bern's) satisfaction that infection must be a frequent, if not the most common, cause.

The paper on "The Chloramine Antiseptics and Disinfectants" by Dr. N. S. Mayo, of Chicago, was one of the most notable contributions to veterinary science that have appeared during the year. Dr. Mayo's paper was splendidly illustrated by three reels of moving pictures, which in addition to showing the remarkable results that may be obtained from Dakin's treatment in operative and

accidental wounds, demonstrated that moving pictures possess extraordinary advantages over clinics as a means of demonstrating operations and methods of treatment.

"Differential Diagnosis of Diseases of the Pig" was discussed by Dr. W. W. Dimmock, of Ames, Iowa, in a paper read by his colleague, Dr. H. S. Murphy. This paper went into the subject at great length and in a measure summarized all that is known on this broad and important subject, as well as bringing out some new points. It was the opinion of the author that veterinarians will never be able to diagnose the ailments of swine with the same accuracy that they can diagnose ailments of the horse and the ox, chiefly because of the heavier chest wall that precludes careful palpation or auscultation, and because of the marked effect on the respiration and temperature of swine that excitement or movement occasions. He believes, however, that there is an opportunity for vast improvement by the average practitioner in the diagnosis of the ailments of swine. He made a particularly strong plea for practitioners to get away from the belief prevalent some years ago that a sick hog had cholera and that a herd in which sick animals appeared needed vaccination. He stated that forty per cent of the average veterinary practice in Iowa was swine practice and that sixty per cent of the income of Iowa practitioners was from swine practice. He spoke of the immensely important work that the B. A. I. has done in research work in swine diseases and deplored the fact that states had not done more. He pleaded for closer and more intimate contact between the state experiment stations and practitioners having to do with swine practice. He censured practitioners for the little help they had given the profession through publications and stated that most practitioners are handicapped in swine practice by their lack of understanding of mixed infections.

Dr. C. Courtney McLean, of Meadville, Pa., a breeder of pure-bred swine, read a most interesting paper on the general subject of swine practice, giving much valuable information and advice in the matter of yarding, housing and feeding swine, caring for them at farrowing time, of treating the sick, performing cesarean section, operating on cryporchid, and ruptured pigs, and other matters of every day practice.

Dr. McLean claimed that swine are the most intelligent of domestic animals and the most abused of the animal kingdom. He pointed out that it is the only food-producing animal from which we may obtain a 2,000 per cent increase in a single year. He spoke of the increase of 4,000,000 swine during the past year as one of the important factors in meeting the requirements of our allies in the exportation of food. He urged that hogs be kept in a decent building, and in decent surroundings, that the building be sufficiently large and admit of drainage (cement floor is not a suitable floor for hogs) and be supplied with pure water and pasture, preferably alfalfa. He contended that boars should not be kept fat, and that sows be not bred to farrow under a year of age. He spoke of the astonishing losses from farrowing and from overlying pigs, most of which is preventable. He stated that his experience in the use of pituitrin had been most satisfactory. He had used this remedy in 1-cc. doses, repeated at fifteen-minute intervals, and seldom had more than two doses been necessary, although he had given four doses when required. He spoke of rupture of the bladder being a common sequence of delayed parturition in sows and of the cesarean section being successful in a high percentage of cases. He urged that pigs be castrated at four weeks of age and weaned at eight weeks.

In his opinion hypodermic medication should be used whenever possible. Arecolin is a valuable drug and has the same effect on swine as on horses. Hypodermic injections are usually given back of the ear. He stated his belief that garbage is not good food for hogs. That a good hog should weigh one hundred pounds when one hundred days old but that garbage-fed hogs never weighed more than eighty pounds when one hundred days old.

"Avian Tuberculosis in Swine" was discussed at length by Dr. L. Enos Day, of Chicago. Statistics were given as to the frequency of its occurrence and

measures for recognizing the avian form of tuberculosis detailed.

Report of Sanitary Science and Police Section

The address by Chairman Dr. J. G. Wills, Albany, New York, was in part as follows: The scope of the section was outlined as consisting of the conservation of live stock and stimulating the maximun animal production. This depends to a large extent upon efficient veterinary service. During the period of the war the possibility of the distribution of the virus of diseases by our enemies cannot be ignored. This fact entails additional demands on our veterinary sanitarian. Oftentimes these demands are hard to meet because of the obscure methods employed by the Hun. The live stock industry of our country demands the very best protection that the veterinary profession can give it. It is highly important at this time that prophylaxis be considered. Control measures are the key-note during the present war. The veterinarian is in a position to bring about great results if he can obtain and keep the confidence of animal owners.

The country districts must become the principal producers of live stock; hence frequent purchases must be made, and it is highly essential that these purchased animals shall be free from disease. Our prestige as a profession depends to a large extent on our ability to rise to this occasion and render an efficient service in the protection of our animal industry. In order to bring about the best results, breeders of live stock and veterinarians must work in harmony for a common good.

We must not forget at this time to give the homage due to those members of our profession who have entered the military service. Our profession has responded nobly to the call and already there are more than 1 500 veterinarians in the national army. The war has added a new importance to the value and care of equines, as large numbers of horses and mules are still used by the army.

The report of the secretary, Dr. H. Preston Hoskins, Parke, Davis & Co., Detroit, Mich., was informal and consisted of general statements regarding the year's work.

The paper on "Practical Methods of Prophylaxis Against Worm Infestations," by B. H. Ransom, Zoologist, B. A. I., Washington, D. C., was in brief as follows: In combating parasitism, methods of prophylaxis are highly important. In order to bring about the best results it is necessary that the methods adopted be based upon a thorough knowledge of parasites, especially their life history and general biology. Methods must vary according to the species of parasite and especially the species of animal affected. There are in round numbers about one hundred species of flat worms and about two hundred species of round worms, hence it is possible to discuss only a very few of these parasites. Those that will be noted are those that have been especially studied by the author.

It has been shown that granulomatous growths on horses occurring in different countries simulate the disease in this country commonly known as "bursatti." This condition has recently been described by Bull as affecting horses in Australia. It has also been described by other authors. This condition is undoubtedly due to a larva nematode worm of the genus *Habronema*.

It has been shown that *Habronema muscae* passes a part of its life history in the ordinary house fly, *Musca domestica*. The fly secures the eggs of the worm from feces of the horse. Many stages of development of the worm are found in the stomach of the horse. It is probable that the horse swallows the flies which are infested with larvae of this parasite, or it may be that the larvae escape from the proboscis of the fly when the insect is obtaining moisture around the lips of the horse, and in the same manner it is quite probable that the so-called "summer sores" are infested in a similar manner, namely, by the fly sucking moisture from sore spots. The control of the disease lies in the eradication of flies that breed in horse manure, and in the proper disposal of feces of the horse.

One of the most important discoveries in parasitology of the last few years has been the exposition that *Ascaris lumbricoides* has a direct life history. Stewart showed that the larvae of this parasite

may pass through the bodies of mice and rats and often produce fatal pneumonia. In the experiments of the author it was shown that *Ascaris lumbricoides* has a direct development in the body of the pig. The adult forms are found in the intestines where the egg is laid. But the larva form migrates to the lungs where it occasionally produces fatal pneumonia. The eggs are present in the feces of a pig infested by this parasite. The eggs are exceedingly resistant and are able to survive long periods of time under very adverse conditions. Formaldehyde has little effect on the eggs of this parasite. It is not easy to control the development of this nematode worm.

As hogs grow older they are less susceptible. Young animals, however, are particularly susceptible to this parasite. It is, therefore, very important to protect the young pigs. The teats of the sow are probably a fertile source of infestation. Prophylactic measures based on the above facts will aid in the prevention of the spread of the disease caused by the parasite.

One of the most important parasites affecting sheep is the common stomach worm known as *Haemonchus contortus*. It has been shown that this parasite has a direct life history. The ova pass out with the feces of an infested animal. The larvae hatch, molt several times and then crawl upon blades of grass. This constitutes the principle if not the only manner of infestation. It has been shown that pasture infestation dies out in about a year. It is, therefore, advisable to plow up and plant or otherwise cultivate infected pasture ground. The disease caused by this parasite is the most fatal in lambs. It has, therefore, been advisable to separate the ewes and lambs and take particular care in the feeding of the lambs. This, however, has not proved to be a very practical method. Another fact that must be taken into consideration in the control of the parasite is that the ewes cannot be rid of *all* the worms.

Cooper Curtice has been obtaining excellent results at the experiment station by following out a regular routine in the summer care of infested ewes and lambs. Yearlings and two-year-olds are treated with fifty mils of one per cent copper sulphate solution every one or two months. The ewes are given one hundred mils of one per cent copper sulphate solution. The lambs are kept on fresh pasture and are changed every two or three weeks. There are many details to this method, but it seems to be practical and apparently gives good results.

Wet land is especially favorable for the development of this parasite. Therefore, in so far as possible, land of this description should not be used for pasturing sheep. In this connection it is well to note that horses and swine are not affected by this parasite.

Principles to Be Observed in Control of Parasitism

1. Long continued use of pasture land is inadvisable.
2. Rotation of pastures should be practiced.
3. Moist or wet land should not be used for pasture more than necessary.
4. The parasites affecting horses, cattle, and swine are usually not transmissible from one genus to the other.
5. Manure should be carefully disposed of, and if possible should be plowed under when spread on land.
6. Animals infested with parasites should be placed in dry yards.
7. Human excreta should be carefully kept from all animals.
8. Stray dogs should be destroyed and dogs should not be fed on uncooked offal.

The paper on "Practical Methods of Treatment for Worm Infestation," by 2nd Lt. M. C. Hall, V. O. R. C., was read in part by Doctor Hoskins. In this paper twelve of the most important parasites were considered and six of the most important drugs. In the methods of treatment for parasitism veterinarians are not always practical. In gauging the efficiency of an anthelmintic the number of worms passed are usually estimated rather than actually counted. As experimental work goes on the drugs recommended may change from year to year. The critical test often shows that drugs that have been considered of great value as anthelmintics are actually valueless. It is highly important that carefully planned and thoroughly carried out laboratory tests be made of all drugs sup-

posed to have anthelmintic properties.

The three most important *Strongyli* affecting horses are *Strongylus vulgare, Strongylus equinum,* and *Strongylus edentatum. Cylicostomum tetracanthum* is also a common parasite of horses. The disease caused by these parasites is characterized by anemia, edema, emaciation, etc. Aneurisms of the mesenteric arteries and other blood-vessels are also common, caused by the larvae of these worms (*Strongylus vulgare*). It is the popular opinion that these parasites are very hard to remove. It has been found, however, that the administration of 16 mils oil of chenopodium given to a horse which has been fasted, followed in a few hours by a quart of oil is from 95 per cent to 96 per cent efficient. Ten mils and 8 mils, respectively, administered to each of two horses which had been fasted for thirty-six hours was not efficient. Turpentine is a fairly efficient substitute for oil of chenopodium. In one experiment, 20 mils of oil of chenopodium failed to remove any *Strongyli.* This animal was killed afterward and found to have only three *Strongyli* in the intestines. In fourteen experiments it was found that *Strongyli* may be removed by oil of chenopodium, also that the *Cylicostoma* are more easily removed than the *Strongyli.*

Horses are often affected with pin worms, technically known as *Oxyuris curvula.* The symptoms of infestation by these parasites are rubbing of the tail, white crusts around the rectum, and passage of the worms with the feces. Railliet uses enemas consisting of a solution of tartar emetic, bichlorid of mercury, areca nut, thymol, etc. The results following the use of these drugs show that they are not very efficient. It has been found, however, that these parasites are relatively easy to remove. Sixteen mils oil of chenopodium, followed by one quart of oil after an hour, is efficient in removing these parasites. The animals should be fasted twenty-four hours before the administration of the oil of chenopodium.

For the removal of *Ascaris megalocephala* it was found that the oil of chenopodium was not efficient. This agent cannot be recommended for the expulsion of these parasites. Further experimentation is necessary to determine the reason why this drug, which is so efficient for the removal of ascaris of man, dog, and swine, is not efficient for the removal of those of the horse. Tartar emetic seems to be the most efficient remedy in the treatment of ascariasis of the horse.

Hemonchus contortus is an exceedingly important parasite affecting cattle and sheep. It is of particular importance in calves and lambs. It has been shown that copper sulphate in one per cent solution is an efficient remedy for this parasite. It should be employed in a one per cent solution and one hundred mils of a one per cent solution of copper sulphate administered to a two or three months' old calf. This should be repeated after a month or six weeks. This treatment is effective in removing stomach worms from calves. In treating sheep for this parasite, a special apparatus consisting of a supply tank and graduated glass tubes fitted to a board with rubber tubes connecting with the supply tank is used. A metal tube is placed in the mouth of the animals to be treated, and this tube is connected to the graduated tube by means of a rubber connection. Various kinds of copper sulphate are found on the market. It has been found that for making one hundred mils of one per cent solution it is necessary to use only 0.8 of a gram of pure crystal or 0.6 gram of the anhydrous product.

Treatment of nodular worms in sheep is relatively ineffective. Intestinal lavage has been used, but it is impractical in large flocks.

Oil of chenopodium used in amounts of 1 mil for every twenty-five pounds body weight up to eight mils, is exceedingly efficient for removing ascaris of swine. The treated animals should be fasted twenty-four hours before the administration of the oil of chenopodium and should not be fed for two or three hours following it. It is best to follow the anthelimintic by a dose of oil. Powders of mineral substances are not efficient for the expulsion of the ascaris of swine. Stock tonics are likewise inefficient for the treatment of the round worms of swine.

To summarize, the most important

anthelmintics are oil of chenopodium, santonin, turpentine, tartar emetic, copper sulphate, and tobacco for use in poultry.

An illustrated lecture on "Practical Methods of Treatment and Prophylaxis for Arthropod Infestations," was given by Seymour Hadwen, pathologist, Department of Agriculture, Ottawa, Ont. A number of the more common ticks were shown, special emphasis being placed on those which cause red water, spotted fever in man, and tick fever in man and sheep. The spotted fever tick is known as *Dermacentor venustus*. *Dermacentor albipictus* is common in various parts of the country and especially in the western parts of Canada. It is possible that this parasite is the cause of certain cases of fistulous withers in horses. This tick injects anticoagulin and gives the opportunity for bacteria to get inside the skin. In Scotland the shepherds grease the backs of sheep to protect them from the ticks.

Several slides of *Tabanidiae* were shown. These insects do not do so much damage in cold as in warm climates. They are able to transmit surra and carry anthrax. *Haematopota pluvialis* and *Chrysops quadratus*, or the common deer fly, were shown. *Stomoxys calcitrans*, which may transmit *mal de caderas*, was also shown. This insect breeds in manure. Coal-tar dips are efficient in keeping away these latter parasites.

Among the other parasites shown were the ordinary sand fly or punky, certain of *Hippoboscidae* especially *Melophagus ovinus*. These parasites have lost their wings.

Specimens of *Trypanosoma Theileri* and *Trypanosoma Americanum* were shown.

The author reviewed the most recent life history of the *Gastrophili*. The larva of the *Gastrophilus intestinalis* formerly known as *Gastrophilus equi* has been shown to bore its way into the mucosa of the tongue. *Gastrophilus nasalis* deposits its eggs between the rami of the jaws and possibly bores its way directly into the skin. This fact accounts for the scabby condition found in this region on animals troubled by these parasites. *Gastrophilus hemorrhoidalis* is the most troublesome of the bot flies. It deposits its eggs around the lips. Animals attacked by this parasite collect in groups and keep their heads together for protection. The animals also often place their heads over each others' necks for the same purpose.

Hypoderma bovis rests on stationary objects between the times when they deposit the eggs. This fly does not harm the animal when depositing its eggs. The egg is laid at the base of the hair, the larva hatches and penetrates the skin. The so-called gadding of cattle is caused by a psychological condition rather than a real injury. *Hyperderma lineata* deposits its eggs around the heels and often simply backs up from the ground in order to lay its eggs. These eggs are laid twelve and fourteen in a row. The larvae of these parasites hatch out and bore their way immediately underneath the skin. Oftentimes the places of entrance of these parasites (*Hypoderma*) can be detected by the small exudation of serum around the spots.

The papers on parasites were discussed by several, including Doctor Dalrymple of Louisiana, Doctor Conway of Missouri, and Doctor Fitch of Minnesota. Doctor Dalrymple pointed out that anthrax was clearly demonstrated to be transmitted by the *Tabanidiae* in Louisiana. Doctor Conway remarked that many of the conditions which have been explained by scientific research previously were connected by popular impression with its cause. This was illustrated by Texas fever. Long before the tick was known to transmit Texas fever, the idea was common that ticks were connected in some way with this disease. Doctor Fitch noted that in Doctor Hall's paper nothing was said in regard to the effect of oil of chenopodium upon the larvae of *Strongyli* found in the blood-vessels and other viscera.

War Session

What was known as the "War Session" of the meeting was held the forenoon of the second day. At the opening of this meeting a message from Secretary Merillat was read. The message expressed the wishes of the writer for a prosperous meeting, recounted some of his experiences during the past nine

months in France, and ended with a plea that the A. V. M. A. do all that it possibly can to raise the standard of veterinary graudates, stating that the war had shown, as nothing else could have shown, the need for highly qualified men in the veterinary profession.

The most important contribution to this session of the meeting was a paper by Major John P. Turner, of the Surgeon General's office, Washington, D. C. Major Turner reviewed at length the growth of the veterinary corps of the army from civil war times, and showed that the advancement of the profession through the military had been beset with many difficulties. He stated that when the present war was declared, there were but fifty-eight veterinarians in the army and there was no veterinary organization. All that has been accomplished by the present veterinary corps has been the result of work done in the past year.

The B. A. I. War Record

The paper by Dr. John R. Mohler, chief of the Bureau of Animal Industry, read at this session, was one of the most encouraging and inspiring papers of the entire meeting. He stated that since the Department of Agriculture undertook the eradication of the fever tick in 1906, three-quarters of a million square miles of territory had been freed in fifteen states and that the work was now 52 per cent completed, was gaining momentum and that the eradication of tick from all continental United States seemed assured within five years, 70,000 square miles having been freed last year. He stated that 266 B. A. I. employes, 264 state employes, and 12,000 county men were engaged in tick eradication in 1917 and that a conservative estimate of the value of eradication per animal was $9.00.

It was stated that the Bureau's control methods for hog cholera had met with marked success, and Dr. Mohler expressed it as his opinion that the reduction in the losses from hog cholera from $75,000,000 in 1914 to $32,000,000 in the past year, was largely the result of this work.

Sheep scab is almost eradicated and the cattle scab quarantine entirely removed. Dr. Mohler stated that tuberculosis is the most widely distributed and destructive disease that now menaces the live stock industry of the country, the annual loss from it being at least $25,000,000. He looked upon the present work of the Bureau in freeing pure-bred herds from this disease as being most important, the pure-bred herds having been in the past the principal source of spread. This work is being carried on in thirty-two states.

The Bureau is producing for the War Department, 30,000 to 40,000 doses of mallein monthly. It has established a diagnostic laboratory at Denver. During the past year, 355 B. A. I. veterinarians have been furloughed for military service and the department has sustained a loss of 12,000 employes who left to engage in industrial work.

Fewer Schools on Accredited List

The Committee on Intelligence and Education recommend that in addition to the four private veterinary schools that have discontinued operations, the veterinary department of the Geo. Washington University be dropped from the accredited list unless that school and the United States College of Veterinary Surgeons immediately combine. The committee stated that both the equipment and faculty of the former school are inadequate and that the latter has a fair building and equipment, but in faculty is lacking. It is believed that if the schools combine, they can maintain a school that will be approved by the members of the association.

The committee recommended that Mr. E. S. Bayard, editor of the "National Stockman, and Farmer" of Pittsburg, and John J. Ferguson, of Chicago, be elected to honorary membership.

They further recommended that the requirements for entrance into veterinary schools be two years of high school work, or its equivalent in academic training as shown by an examination before a state board of education, for the present session; three years of high school work next year; and four years, beginning in the fall of 1920. All recommendations of the committee were adopted.

An Instructive Autopsy

Owing to a delightful excursion on the Delaware River which had been planed by the local committee and the H. K. Mulford Company, there was insuffic-

ient time for a clinic, but in lieu of the clinic, a most instructive autopsy was conducted at the University of Pennsylvania by Dr. W. A. Crocker. This autopsy was a revelation to all who had not seen Dr. Crocker in this work previously, not excepting those familiar with his new book on the subject and who expected much of him. With Dr. Crocker in charge an autopsy is not only a practical means of arriving at a diagnosis in doubtful cases, but it is a work of art, of a high order. Those present were particularly favorably impressed by the facility with which Dr. Crocker uncovered the spinal cord of a horse; beginning with only the ribs removed it took him less than five minutes to completely uncover the spinal cord and lift it out entire, and his technic was such that it might be employed by anyone with a minimum of practice.

H. R. Mulford Co. Entertained the Association with a Delaware Boat Trip

The boat ride from Philadelphia to Wilmington, Delaware, was one of the most enjoyable and instructive entertainment features ever offered an A. V. M. A. gathering. The party was taken through the center of the ship-building industry of America and had an opportunity to see close at hand many hundreds of ships in various stages of construction, passing the New York and Hog Island yards, about which so much has appeared in the daily press, and many others of lesser size, but by no means small proportions.

New Orleans Next

The time and place of the next meeting of the association was not definitely decided, but a motion was adopted announcing the preference of the association for New Orleans, and in the absence of unforeseen circumstances, the next meeting of the association will be held in the Crescent City probably in October, 1919.

Editor Dalrymple Now

The induction of Dr. P. A. Fish into military service led to his resignation as editor of the Journal of the association. Since the meeting adjourned, Dr. W. H. Dalrymple, of the University of Louisiana, has accepted the position of editor and the journal will, in the future, be published at Baton Rouge.

Mr. Thomas E. Wilson of Wilson & Co. presented the Association with portraits in oil of Drs. Salmon, Melvin and Mohler, the presentation address being made by Dr. R. F. Eagle, superintendent of Wilson & Co. The paintings will be hung in the gallery of the Saddle and Sirloin Club of Chicago. In his address, Dr. Eagle reviewed the lives of these illustrious representatives of the veterinary profession, paying a high tribute to their various activities, notable achievements, and valuable contributions to science, which have been important factors in the onward march of civilization. It is the hope of the committee that this initial effort will be enlarged upon, and that the veterinary gallery of the Saddle and Sirloin Club will be further used to show recognition and appreciation to those of the profession entitled to such honor. A movement is already under way to place paintings of Leonard Pearson, John G. Rutherford and Sesco Stewart in this gallery.

Liautard-American Relief Fund Now

On the recommendation of the Executive Board the name of the American Veterinary Medical Association Relief Fund was changed to the Liautard-American Veterinary Relief Fund, and Dr. T. E. Smith of Jersey, N. J., treasurer of the committee charged with raising this fund and in the absence of Major Blattenberg acting chairman, reported that the fund collected by the committee to date amounted to a little over $5,100.00. The report of the secretary of the Illinois Veterinary Medical Association shows that considerable more than one-fourth of the entire fund was contributed from that state. The contributions from Iowa also were large, indicating that the total fund raised will be a large one when the matter is taken up by other state associations and worked out as has been done in Illinois and Iowa.

B. A. I. Entitled to Active Support of A. V. M. A.

At the meeting in Kansas City something more than two hundred veterinarians in the B. A. I. were elected to membership and, as stated heretofore, at this meeting the new members from this source totaled upward of five hundred, making an increase of members from the B. A. I. of more than seven

hundred in about a year. Previous to the Kansas City meeting, few B. A. I. veterinarians were members of the A. V. M. A. This sudden rush to the association on the part of B. A. I. men led to some criticism by a few of the members present, who contended that the B. A. I. men were coming into the A. V. M. A. for selfish purposes and not for the advancement of the profession in general, but hoping thereby to secure the powerful influence of the A. V. M. A. to obtain for them an increase in salary.

In the Journal's opinion these charges are unwarranted and unjust. The veterinarians of the B. A. I. are entitled to more pay than they are getting and as part of the veterinary profession whose advancement means an advancement of the whole profession, the A. V. M. A. is in duty bound to render them every assistance for improving their condition that it possibly can, just as it labored for many years and finally successfully, to bring about improvement in the status of the veterinarian in military service. If the B. A. I. men are willing to join the association in large numbers and support this effort with their influence and their dues, it is so much the more creditable for them. However, a movement was started at Philadelphia among the B. A. I. men that if not dropped, and it appears there is little indication that it will be dropped, will do much in the minds of some to confirm the truthfulness of the charge of selfish motives on their part.

Two Board Members to Elect

The term of office of Dr. W. Horace Hoskins, member of the executive board for the old and the new second district, has expired and a successor is to be elected at once, and of course, it is necessary to elect a member of the executive board from the new third district. In both of these districts there are now many members of the association in the B. A. I. service. In the latter, the number is particularly large, there being nearly one hundred at Chicago, about one-fourth as many at Milwaukee, and a considerable number at Indianapolis, Cincinnati, Columbus, Detroit, and other points, and an active campaign has already been started to combine the vote of all of these for a single candidate, a representative of the B. A. I., for the executive board. Should such a combination be effected, it will be tantamount to controlling the election, since in the district five men will be voted for and there is a probability that the vote other than the B. A. I. vote would be split into four, somewhere near equal parts.

In the new second district where the B. A. I. members of the A. V. M. A. are no where near so numerous, they still constitute a number to be reckoned with, and they are already talking of combining on a man favorable to them, after the nominations are made.

Head of B. A. I. Now on Executive Board

As a matter of fact, all members of the executive board are favorable to the B. A. I. and no one prejudiced against it has ever been elected or is likely to be elected in the future. The B. A. I. already has one representative on the executive board and has had since the beginning of the present organization; even when its total membership in the A. V. M. A. was less than two hundred, it had one out of six members of the board. To organize a campaign and carry through measures which some have already planned to increase their present representation to one-third or half of the entire board would in our opinion be unwise and would prejudice their cause in some degree not only with the veterinary profession at large, but with congress and the secretary of agriculture, irrespective of the ability and qualifications of the men they might elect.

Candidates for Executive Board Memberships Should Be Elected on Their Records in Association Matters

The Journal believes that it is to the best interest of the A. V. M. A., and the B. A. I. as well, that their votes for members of the executive board be cast for candidates for other reasons than to obtain representation for the B. A. I. on the executive board. The adoption of the present plan of organization in the A. V. M. A. was to accord the veterinary profession representation on the executive board by geographical sections and to avoid the connivances of cliques and classes.

Results With Blackleg Filtrate

Substantiated by Professor Naoshi Nitta of the Laboratory of Veterinary Pathology and Bacteriology, Tokio Imperial University of Japan

In the July issue of the Journal of the American Veterinary Medical Association, an article appeared by Professor Naoshi Nitta in charge of the Laboratory of Veterinary Pathology and Bacteriology of the Tokyo Imperial University on "Investigations on Blackleg Immunization" in which the results of extensive experimental work with the various blackleg products are reported with the following conclusion:

> "The filtrate of a pure culture of the blackleg organism confers a solid immunity on animals treated and it has been already successfully used in thousands of cattle in infected districts. It is inexpensive, the material for the preparation being aërobic cultures of the organism in meat-piece broth, and its injection is not accompanied by the least danger, because the filtrate is quite germ-free."

Furthermore, it is stated in the article that Blackleg Filtrate alone is now being employed in Japan and Korea for vaccination against blackleg.

The Lederle Antitoxin Laboratories were the first to prepare Blackleg Filtrate in the United States and further develop it to the present stage of perfection.

The claims of superiority of Blackleg Filtrate over all other products by Professor Nitta only substantiates the results attained with Blackleg Filtrate—Lederle in the United States.

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The extensive available data shows that only one-twenty-fifth of one per cent

of the animals vaccinated with the Filtrate died of blackleg, which must be accepted as a remarkable record if it is considered that the vaccination has been frequently undertaken only after actual losses from blackleg have occurred among the animals.

Veterinarians should not hesitate to use Blackleg Filtrate—Lederle. It is not in the experimental stage. Its effectiveness has been conclusively proven.

It is strictly a laboratory product and therefore can be accurately controlled during the process of manufacture. This must be recognized as a great asset since other products used for vaccination against blackleg cannot be subjected to such control.

The outstanding features and advantages of Blackleg Filtrate—Lederle are:

1. It is an effective immunizing agent against blackleg.

2. It confers an active immunity, which protects cattle against the disease for at least one year. According to a recent ruling by the United States Bureau of Animal Industry there is not sufficient evidence available to prove that any blackleg product will produce permanent immunity.

3. Since it does not contain the blackleg germ in any form, it cannot produce the disease; therefore, losses incidental to vaccination with the powder or pellet form are entirely avoided.

4. It is prepared in a concentrated form, is suitably preserved and will retain its uniform potency for an almost indefinite period of time.

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Matters of Current Interest

BRENNER VISITS FAMOUS BLUE GRASS REGION

New York, Aug. 15.—I have covered a wide area, both via auto and train, and have encountered many interesting situations since my last report, some six weeks ago.

In actual mileage, I have traveled 3,000 miles in the Reo and just the same distance in Uncle Sam's cars. Interspersing machine and train gave me ample opportunity to determine which mode I prefer—unhesitatingly I say, "the auto for mine."

Perhaps the chief points in my recent jaunts were visits to Camp Taylor, Ky., Ft. Oglethorpe, Ga., and the famous Blue Grass region of Kentucky.

Capt. Thomas D. James, commander of the Remount Depot at Camp Taylor, made my visit there a most enjoyable one. Capt. James formerly practiced at Scranton, Pa. He is about "as pleasant a fellow as they make 'em," holds the respect of the men under him, stands in with his commanding officer, and has made an enviable record in his work at the Remount. Lt. John R. Edwards, George Place, Maurice Quinn and Herbert Kettler were assigned to the Camp Taylor Remount at the time I visited there.

The nation's largest artillery camp is being established at West Point, just twenty miles from Camp Taylor. Lts. Bratten, Boyer, Graves, and Baumgartner have been put in charge of the horses there.

In Louisville, I found the practitioners pretty busy men. Drs. Miller and Caldemeier enjoy one of the biggest practices in the Middle States. Dr. Harthill also has built up an enviable practice.

Prior to driving down to Louisville, I attended the Illinois State meeting at Champaign, the Missouri Valley at Omaha, and the Missouri State at St. Joseph. These meetings were all well attended and offered splendid programs. The Illinois meeting, by the way, was one of the best all around sessions ever held in the Middle West.

At Louisville, I boarded a train and dropped down to Camp Greenleaf, at Ft. Oglethorpe, Ga., I had visited Camp Ogle-

UMBRELLA ROCK, LOOKOUT MOUNTAIN. Left to right, above, Lts. Foster, Martin, Moles, LeBlanc, Jones, Irish, Egin, Nichols, and Guffey. Below, Lts. Hastings and Sharpe.

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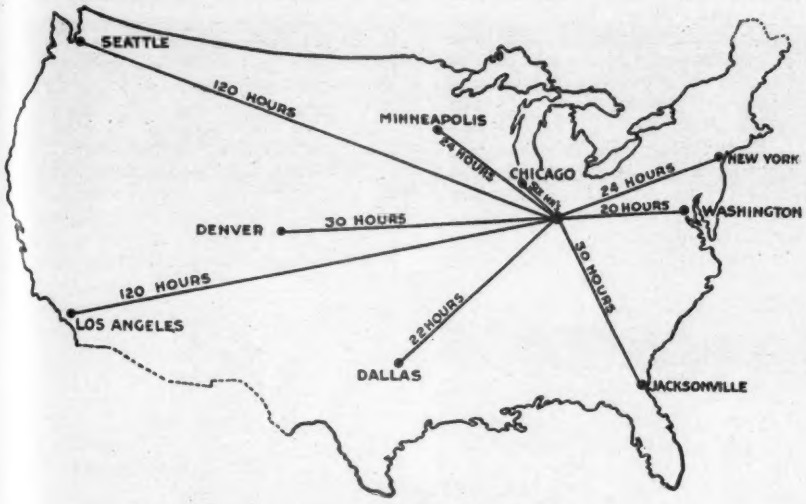

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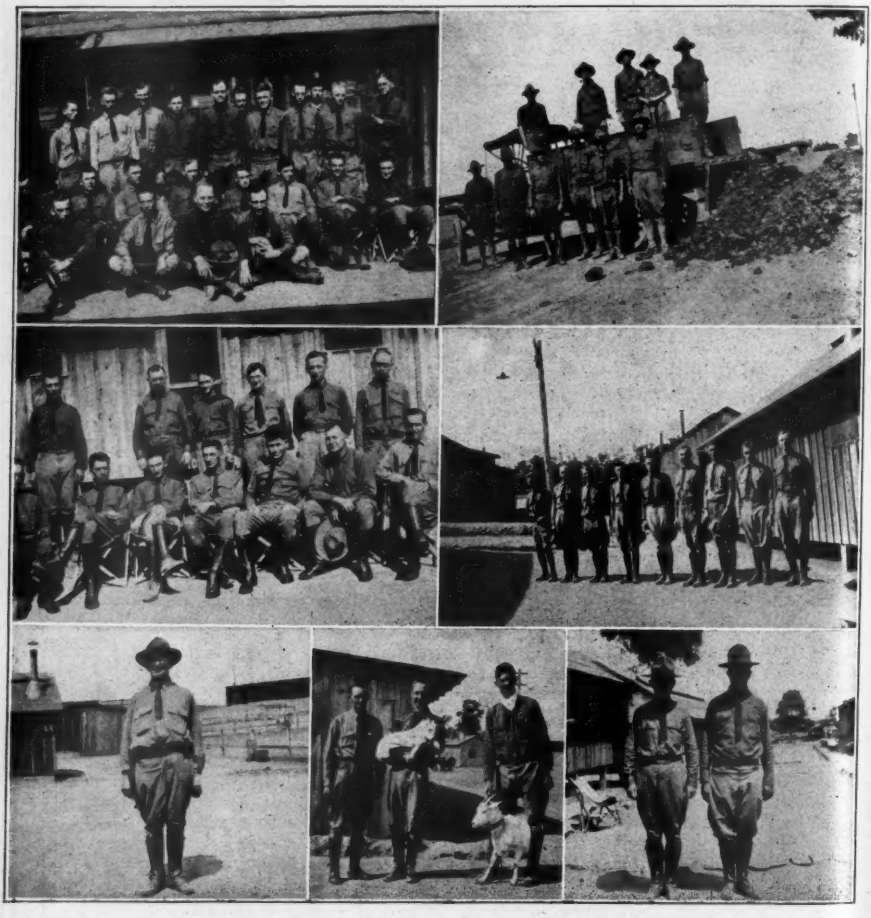
thorpe twice before, and I observed quite a change at the camp since the occasion of my former visits. Here I found two hundred commissioned veterinarians and some three hundred graduates of the 1918 classes, in the capacity of privates, going through a most intensive course of military and semi-scientific training.

Major W. J. Stokes is in full charge of the entire school. He is ably assisted by Lts. Longley, Chase and Lambert. The commissioned men are required to take a sixty-day course here. One hundred men are graduated every two months. It is my understanding that the officials intend to have every officer in the veterinary corps attend the school.

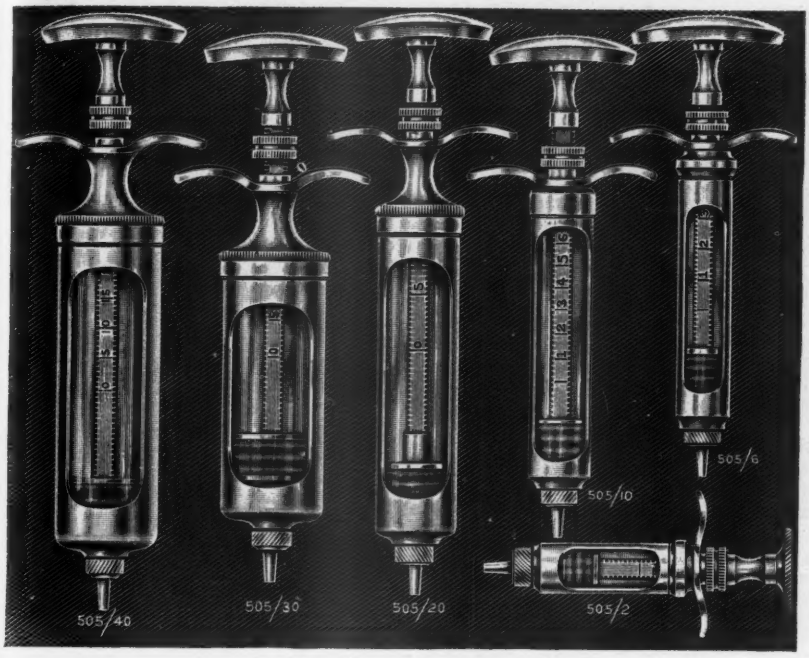
Major Stokes is an army officer of many years' service and while his task at this school is a gigantic one, he is proving equal to the occasion.

Capt. F. C. Maguire and Lt. G. M. Jones are in direct charge of the 1918 boys. These boys are interested in practical stabling, feeding, conditioning, general animal husbandry, foot and mounted drill, tent pitching, cavalry and infantry pack, etc.

It is inspiring to see how enthusiastically,



Upper left hand: A group of Camp Greenleaf graduates recently assigned to various camps about the country. Upper right hand: A group of 1918 graduate veterinarians acting in the capacity of rookies at the Camp Greenleaf training school. Center row: Some of our boys now in training at Camp Greenleaf. Lower left hand: Capt. James, formerly of Scranton, Pa., now in charge of the Remount Depot at Camp Taylor, Ky. Center: The boys at Camp Greenleaf have "their own goat"—Mascot of the Battalion. Lower right: Capt. Maguire and Lt. Jones, who are in direct charge of the training of the enlisted personnel at Camp Greenleaf.



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energetically, and willingly these young veterinarians are pitching into this hard work. Every individual is going in with determination to qualify for a commission. These boys will shortly be given an examination for second lieutenants' commissions, and competition here is keener than it was in college. Capt. Maguire and Lt. Jones, acting under Major Stokes have organized their school and are working wonders with their students.

From Ft. Oglethorpe I went back to Louisville, and with the Reo began my initial invasion of Kentucky. Kentucky, the far-famed state of fast horses, had long been, a "Land of Dreams," to me. I had often heard of the wonderful Blue Grass country, and the many stories told me about "My Old Kentucky Home" created within me a craving and desire to see this beautiful pictured land. I am pleased to report that everything I saw and learned about Kentucky came up to my fondest expectations.

First of all, I ran across a pretty good bunch of veterinarians. Conditions with the practitioners are very promising. Not so many years ago, this state was classed among the poorest "veterinary states" in the Union. But a good state association, now headed by Dr. Purdy of Shelbyville, and the efforts of Dr. S. F. Musselman, the very popular state veterinarian, have resulted in bringing about a more favorable situation for the qualified man.

There are now 147 licensed graduates in Kentucky, 106 of whom are in general practice. Thirty of this state's men are now in the army service. There are 375 non-graduates listed in Kentucky. This is an astonishingly large figure, but, strange to

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relate, the non-graduate does not trespass in the field of the graduate. The non-graduate activities are limited and curbed by legislation, so that he interferes but little with the field of the graduate.

DR. M. A. PURDY OF SHELBYVILLE, KY., President of the Kentucky State Veterinary Medical Association. The mold was destroyed after Dr. Purdy was cast. There is not and will not be another like him.

1917 VOLUME I

JOURNAL OF DAIRY SCIENCE

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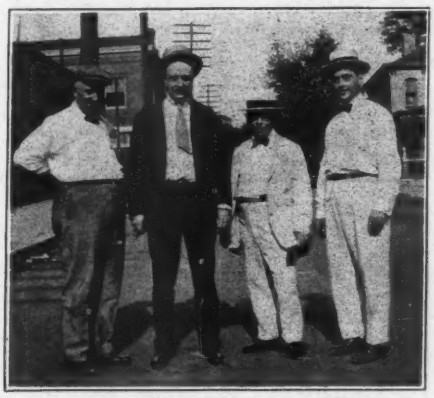
I found good roads, good crops, and mighty pretty scenery all along the line. Lexington, now, as always, is the real center in America, of the thoroughbred.

Despite the many tales we hear of "the passing of the horse," there is as much, perhaps more, interest shown in high-class horses, and especially in breeding, than ever before. Horsemen here, realize that in the devastation of the Belgian and other prominent horse lands of Europe, it will be up to America to furnish the nucleus for the rebuilding of the horse industry over there, and Lexingtonians are preparing for the emergency and opportunity.. The gigantic stock farms, covering thousands of acres and housing hundreds upon hundreds of the world's greatest and highest priced brood mares, are beyond question the finest in existence. The improvements, alone, on these farms represent gigantic investments.

Drs. Coover, Wehle, Phelps, Land, Haggard, and Shannon are located in practice in Lexington.

The Kentucky Experiment station, where a lot of good work has been done, is located here, also. Dr. R. L. Pontius is the director.



Familiar faces seen at the Missouri State meeting held at St. Joseph, Mo., last month. Left to right: Mr. Shartle, of the Eucamphine Co.; Mr. Goebel, of the Fowler Serum Co.; Mr. Gross of the Abbott Laboratories; Dr. Lopp, of the Universal Serum Co.

My speedometer registered 31,000 miles the morning I left Lexington headed for Philadelphia.

Word has been received from Dr. Fred Emerson, Ottawa, Kansas, now in the service, of his safe arrival "over there."

WEST VIRGINIA MEETING

The thirteenth annual meeting of the West Virginia Veterinary Medical Association was held at Parkersburg, July 17 and 18, a large attendance being present.

The following officers were elected for the ensuing year: President, Dr. J. J. Cranwell, Clarksburg; Vice-President, Dr. J. C. Callender, Parkersburg; Secretary-Treasurer, Dr. Ernest Layne (re-elected for the fourth time).

Nine new members were taken into the association, being men who had recently satisfactorily passed the state examination.

Several very interesting clinics were held at Dr. Callender's hospital, and various papers on vital subjects were discussed.

Hon. J. H. Smith, Commissioner of Agriculture, was present and some very important steps were taken to increase the usefulness of his office and further the interests of the veterinary profession. A splendid banquet was served at the Chancellor Hotel at the close of the meeting.

ERNEST LAYNE, *Sec.*

Dr. R. C. Surface, who has been in the service of the B. A. I. at Ashdown, Ark., has severed his connection with the bureau to engage in private practice at Altamont, Mo.

ANNUAL MEETING OF TEXAS ASSOCIATION

The State Veterinary Medical Association of Texas held its eighth annual meeting at College Station, Texas, July 29, 30, 1918. From the standpoint of attendance and general excellence it was one of the best meetings ever held in Texas, and as at the meeting last year the air of good fellowship, camaraderie, and harmony was everywhere noticeable. about sixty per cent of the members were in attendance, and when the fact that twenty-two of the membership are in the army is considered, this attendance was indeed good. The regular meeting place of the Association is at Fort Worth, but as the State Veterinary School at the A. & M. College was to be formally opened July 30, it was arranged to hold the annual meeting there in connection with the opening so that those attending could come into closer touch with the men having veterinary education in Texas in charge.

The following papers were presented:

"Hemorrhagic Septicemia, Its Clinical Diagnosis," by Dr. H. Jensen.

"Laboratory Diagnosis of Hemorrhagic Septicemia," by Dr. H. Schmidt.

"Hog Cholera Control in Texas," by Dr. F. R. Jones.

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HEMORRHAGIC SEPTICEMIA in sheep has been very prevalent during the past year in Colorado, Nebraska, Iowa and other mid-west states. Wherever the vaccine was used the losses were immediately stopped. This was especially true in Colorado, where a Veterinarian from the State College conducted the field tests and administered the vaccine.

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Georgia State College, Athens, Ga., care Dr. J. E. Severin.
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"Infectious Abortion in Cattle," by Dr. A. T. Kinsley.

"Treatment of Sterility and Contagious Abortion in Cattle" by Dr. R. P. Marsteller.

"Tuberculosis Among the Beef Breeds and Methods of Control," by Dr. E. F. Jarrel.

"Anthrax and Its Control," by Dr. W. H. Dalrymple.

The discussion of these papers was greatly enjoyed by all, and brought out many interesting facts. Officers elected for the year 1919 are: Dr. N. F. Williams, president; Dr. W. G. Gregory, first vice-president; Dr. E. M. Wiggs, second vice-president; Dr. W. G. Brock, secretary-treasurer. Twelve men were elected to membership. The association is in a flourishing condition, sound financially, and with absolute singleness of purpose, harmony prevailing.

On the morning of July 30, a clinic, in charge of Dr. W. G. Gregory, was held at the college hospital. The variety of cases, and number of animals presented was so great, that one day did not suffice, so a number of men stayed over the following day to finish. This was undoubtedly the best and largest clinic ever held in the state.

The formal opening of the State School of Veterinary Medicine of A. & M. College took place at 8:30 p. m. July 30, Dr. R. P. Marsteller presiding.

Addresses were given by Drs. Mark Francis, A. E. Flowers, E. F. Jarrel, W. H. Dalrymple, and F. R. Jones. As Dr. Williams was obliged to leave for Stillwater, Oklahoma, where he participated in the program of the Oklahoma State Veterinary Medical Association, Dr. W. G. Gregory responded for the State Veterinary Medical Association. Much merited praise was bestowed upon Dr. Mark Francis and his co-workers for their untiring efforts in bringing this magnificent veterinary school into existence.

The meeting adjourned thanking the College Station folks for their hospitality and kindness, and pledging entire loyalty to the new school, its aims, and aspirations.

E. M. WIGGS.

Dr. J. H. Harvey, Salinas, Cal., has arranged to take over the practice of the late Dr. L. C. Kennon at Merced, Cal.

The report of the inspection work done in the state of Washington, under the direction of Dr. L. C. Palton, for 1918 shows that upwards of 48,993 farm animals were inspected during the past year, and 1,333 cases of glanders in horses were located.

Dr. Clay, formerly located at Lytton, Ia., has removed to Sac City in the same state.

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PRESENTATION TO DR. C. D. McGILVRAY

A social gathering of members of the Veterinary Association of Manitoba and officers of the Health of Animals' Branch of the Dominion Department of Agriculture, was recently held at the Royal Alexandra Hotel, Winnipeg, for the purpose of tendering to Dr. C. D. McGilvray, Chief Inspector of the Health of Animals, Branch in Manitoba for the past fourteen years, and Secretary-Treasurer and Registrar of the Veterinary Association of Manitoba, on the occasion of his appointment to the position of Principal of the Ontario Veterinary College, a testimonial of their appreciation of the highly valuable services rendered by him to the veterinary profession, and to the province, and the work accomplished under his supervision, in the eradication of contagious diseases among live stock.

The gathering comprised about fifty veterinarians and officers of the Health of Animals' Branch, and was presided over by Dr. W. J. Himna, president of the Veterinary Association of Manitoba.

A number of excellent addresses were given, expressing the high esteem in which Dr. McGilvray is held by the members of the veterinary profession in Canada, and letters were read from Dr. J. G. Rutherford, C. M. G., of the Natural Resources Department of the Canadian Pacific Railway Co., Dr. F. Torrance, Veterinary Director General for Canada; Dr. F. S. Tolmie, M. P., Dr. J. P. Molloy, M. P., and others, all adding their testimony to the good work performed by Dr. McGilvray and extending their good wishes.

Addresses were given by the Chairman, Dr. W. J. Hinman; Dr. D. H. McFadden, Emerson; Dr. R. G. Chasmar, Secretary-Treasurer and Registrar Saskatchewan Veterinary Association; Dr. W. A. Dunbar, Winnipeg; Dr. Chas. Little, Winnipeg; Lieut. E. R. Maynard, Canadian Army Veterinary Corps; Dr. S. A. Coxe, Brandon; Dr. H. Bradshaw, Portage-la-Prairie; Dr. S. T. Martin, Winnipeg; Dr. J. A. Stevenson, Gretna; Dr. J. W. Purdy and Dr. H. H. Ross of the Federal Meat Inspection Staff; Dr. B. A. Bescoby, Acting Chief Veterinary Inspector for Manitoba; Dr. E. S. Bowman, Veterinarian of the City of Winnipeg Health Department; Dr. Lee of Minto; Major S. Robinson, Brandon; and Dr. Ord Graham, Winnipeg.

Following the addresses, Dr. J. D. Ross, on behalf of the officers of the Health of Animals' Branch in Manitoba, presented Dr. McGilvray with a handsome gold watch and chain, suitably engraved, and Dr. W. A. Shoults, in a happy and apt speech, on behalf of the members of the Veterinary Association

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We have acquired the entire veterinary stock, books, plates and copyrights of Wm. R. Jenkins, bankrupt. It will require about thirty days to catalog these books and place them in our stock. Until this is completed, we shall supply them on all orders at the wholesale price, 25 per cent less than list, and will prepay transportation on orders amounting to $10.00 or more.

Here are a few of the titles—Look them over

	List Price	Oct. Price
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CADIOT.—Clinical Veterinary Medicine and Surgery	6.00	4.50
CADIOT and ALMY.—Treatise on Surgical Therapeutics of Domestic Animals	6.00	4.50
CLARKE.—Horses' Teeth	2.50	1.87
DALRYMPLE.—Veterinary Obstetrics	2.50	1.87
DOLLAR.—Operative Technique	4.00	3.00
DOLLAR.—Regional Surgery	6.25	4.70
DOLLAR and MOUSSOU.—Diseases of Cattle, Sheep, Goats and Swine	8.75	6.55
GODBILLE.—Lymphatic Glands in Meat-producing Animals	2.00	1.50
HASSLOCH.—A Compendium of Veterinary Materia Medica	1.65	1.25
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LIAUTARD.—Manual of Operative Surgery	5.50	3.15
LIAUTARD.—Lameness of the Horse	2.75	2.05
OSTERTAG.—Guide for Meat Inspectors	2.75	2.05
ROBERGE.—Foot of the Horse	3.00	2.25
WILLIAMS.—Principles and Practice of Veterinary Surgery	8.25	6.20
WINSLOW.—Veterinary Materia Medica and Therapeutics	6.60	4.95

About 75 other titles are included in this lot. The number of copies of some of them is very limited. In addition to a big saving in the cost, an early order may procure a work that may not be available later.

American Journal of Veterinary Medicine

9 South Clinton Street, Chicago, Ill.

of Manitoba presented Dr. and Mrs. McGilvray with a beautiful silver tea service.

Dr. McGilvray, in returning thanks, referred to the high standing which the Veterinary Association of Manitoba held among Veterinary Associations in Canada and the lead which it has always taken in matters pertaining to the welfare of the profession. He also referred to the work performed by the Health of Animals' Branch, both in the eradication of contagious diseases among live stock and also the important work of meat inspection, and expressed his appreciation of the co-operation which he had always received from the members of the staff. He hoped that, in his new position, he would be able to do still more for the veterinary profession in Canada.

J. B. STILL, *Sec.-Treas.*

The Georgia State Veterinary Association will hold its twelfth annual meeting at Atlanta, Ga., October 16 and 17, 1918. A good program is being prepared and the prospects are good for a large attendance.

Dr. H. G. Thompson, Davenport, Ia., recently moved into his new veterinary hospital, at 108 East Fifth Ave.

BRISK HORSE MARKET EXPECTED

As a forerunner of what Montana horsemen anticipate will be a brisk horse market in the near future, special pens in the railroad stockyards throughout the state are being disinfected, under the direction of Dr. Ewers, of the B. A. I., now in the service of the war department, and reserved exclusively for government shipment of horses. Stockmen say that no horses have been purchased in Montana or other northwestern states for military purposes during the past year. It is pointed out that if the American army is increased to five million men, there must be a proportionate increase in the number of horses needed, and even with the present expansion of the army, the government will stand in need of a large number of horses.

IOWANS TO MEET IN OCTOBER

Extensive preparations are being made by the officers and executive board of the Eastern Iowa Veterinary Association for the annual meeting of the association, which will be held at the Montrose Hotel, Cedar Rapids, October 16 and 17. An excellent program has been prepared and a goodly attendance is hoped for.

DR. GEO. R. WHITE, President and Veterinary Director (Formerly State Veterinarian of Tennessee)

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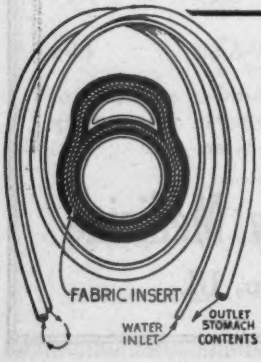

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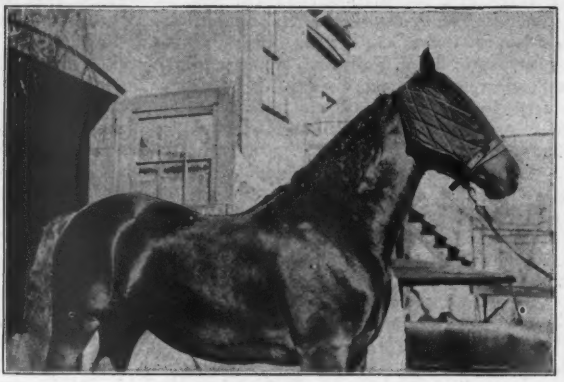

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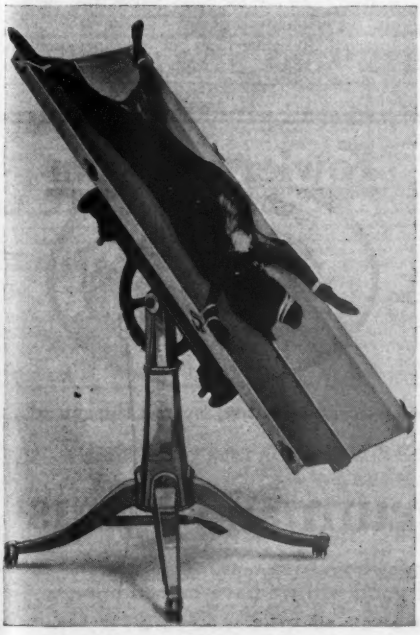

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Sheet Nickel Bed, $75.00

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IN THE GRIP OF THE LAW

Practicing veterinary medicine without a license is becoming more and more difficult, as many are finding out to their sorrow and discomfort. The following cases have recently come to our notice:

William Sargent, of the National Stock Yards, East St. Louis, Ill., was arrested by Inspector J. W. Follmer. His case which will soon come to trial is said to be particularly flagrant. Bert Tucker also of East St. Louis, was fined $50 and charges for the same cause.

Alvin Rodenberger, of Allentown, Pa., was recently arrested and will soon be tried on a charge of practicing veterinary surgery without a license.

Al Gordon, of East St. Louis, Ill., was recently fined $50.00 and costs for practicing without a license, on complaint brought by Inspector Follmer.

Within a short time Gordon was again before the court charged with representing himself as an officer of the Humane Society, and attempting to collect a fine of $65 from a driver. He finally induced the driver to let him treat his horses for $3.00. One horse died as a result of the medicine given, leading to Gordon's arrest. He was fined $100 and costs.

YOU ARE DOING IT

Every time you read, you purchasers of Liberty Bonds and War Savings Stamps, of what the United States is doing in France in building wharves and railroads, or deluging the Germans with gas, or shelling them out of position with big guns or shrapnel, or of bombing their arsenals or cities, or of the great work of our Army and our Navy, or of the building of ships here, or of any or all of the great or small achievements of America, here, or aboard, or on the seas, you buyers of Liberty Bonds and War Savings Stamps truthfully can say, "I had a hand in this": "I contributed to this"; "I am helping do this"; "It is part my work."—U. S. Treasury Department.

The Federal Narcotic Law is to be amended through the medium of the new War Tax Law. This amendment has been drawn by a sub-committee composed of Representatives Rainey and Moore. Section 1 of the Federal Norcotic Law is amended to impose an annual tax of $24 upon importers, manufacturers, producers or compounders, of $12 upon wholesale dealers, of $6 upon retail dealers, and of $3 upon physicians, dentists, and veterinary surgeons. There is levied an Internal Revenue Tax of one per cent per

U.S. Veterinary License No. 103

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We comply with every existing regulation prescribed by the Bureau of Animal Industry.

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are made by veterinarians who strive earnestly to maintain the eminence and good will we have earned.
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ounce upon the affected narcotics, such tax to be paid by the importer, manufacturer, producer or compounder by appropriate stamps which must be affixed to the container so as to securely seal the stopper, covering or wrapper. This tax is in addition to the import duty. Said narcotics may only be sold or possessed in the original stamped packages, provided, however, that this does not apply to any person having possession through a registered dealer in pursuance of a prescription issued by a registered physician, dentist or veterinary surgeon, if the container in which such drug has been put up by the dealer bears detailed information. This does not apply also to the giving away of said narcotics to a patient by a registered physician, dentist or veterinary surgeon in personal attendance upon such patient, and where such drugs are dispensed or administered for legitimate medical purposes and the record kept as required by the Act.

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HEMORRHAGIC SEPTICEMIA KILLS SHEEP

Investigation by the Bureau of Animal Industry as to the cause of the death of many sheep throughout Colorado from unknown causes established the fact that the deaths were due to hemorrhagic septicemia, which has recently made its reappearance among cattle in Colorado.

PROMINENT B. A. I. MAN MARRIES

We are pleased to chronicle the marriage of Dr. Earl Sayle Brashier to Miss Annie Laurie Tinnin, at Meridian, Mississippi, August 11, 1918. They will make their home at Athens, Ga., where Dr. Brashier, now engaged in B. A. I. field work, is stationed. Dr. Brashier was formerly professor of anatomy at the Chicago Veterinary College, and later was engaged in the extension service of the Iowa State College. He also holds a commission in the V. R. C.

Dr. D. A. Cahill, of Monticello, Ill., was recently badly burned about the face and it was feared that he had been blinded, when reaching up to a high shelf for a bottle of carbolic acid, he knocked the bottle over, and in attempting to seize it, broke a bottle of nitric acid, the contents of both bottles pouring over his face, burning the flesh severely. He was taken to a hospital in Decatur where his wounds were treated. It was found that his eyes were not permanently injured.

THIRTY YEARS' SERVICE

Major Fred Foster, who has recently been transferred from the veterinary hospital at Ft. Sam Houston, to Camp McClellan, where he is camp veterinarian, has completed thirty years' service as veterinarian in the U. S. A. He has had a varied experience since he joined the Tenth Cavalry at Santa Fe, New Mexico, 1888. After eleven years' service in this regiment, he went to Cuba with the Seventh Cavalry. From there he went to Fort Ethan Allen, Vermont, with the Artillery corps; then to the Second F. A.; then the third Cavalry; then the Seventh F. A.; then to the veterinary corps at Fort Sam Houston.

Dr. R. J. W. Briggs, of the B. A. I., formerly of the force of Dr. J. S. Koen, Des Moines, Ia., has been transferred to Louisina, where he has been made inspector in charge of hog cholera control work, with headquarters at Baton Rouge.

Ohio Permit No. 28.
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BECAUSE it is soluble in water and under no circumstances will precipitate elementary iodine.

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KANSAS TO HAVE FEWER DISTRICT ASSOCIATIONS

Hitherto Kansas has been supporting, besides the state veterinary medical association, eight subsidiary district associations. For some time it has been the consensus of opinion that the interests of the profession would be better served by reducing the number of districts to four, and following action taken at the last state meeting, committees have been appointed by the various district associations to pass upon the question. At a recent meeting of the committee from the Fifth District, the following resolutions were passed:

Resolved, That the state of Kansas be divided into suitable districts, not to exceed four, instead of the present eight congressional districts, this division to be made by a committee appointed at the annual meeting to be held in January, 1919.

Resolved, That the members of this district do hereby pledge their support to the Live Stock Sanitary Commissioner and Federal Bureau of Animal Industry, in the performances of their duty and in any district, are ready to hold emergency meetings any time that conditions may demand.

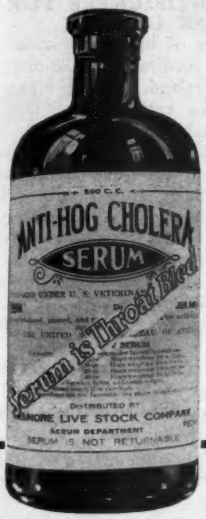
A. H. WHITNEY, H. M. GRAEFE, W. N. HOBBS, I. F. HEMPHILL and F. W. GALLEY, *Committee.*

DISEASE DUE TO IMPROPER FEEDING

According to a recent report by Dr. Geo. H. Glover, Colorado Agricultural Experiment Station, Fort Collins, Colo., a disease which caused many deaths among cattle in Colorado last summer has reappeared this summer in the dryland districts in a severe form. The animals are apparently afflicted with paralysis of the optic nerve and tongue, without inflammation of these or adiacent organs. There is congestion of the brain with little, if any, fever. The animals seem unable to eat or drink, but if food is placed in the mouth they masticate it with avidity and swallow it without difficulty. If water is poured into their mouths they can swallow it easily and evidently want more.

While the cause of this condition has not been determined, bad water and scarcity of food seem to be contributory factors. If the animals are fed artificially and watered for a few days they almost invariably recover, otherwise they usually die. No poisonous plants were found that could be considered responsible, and in the absence of definite information. Dr. Glover suggested that artificial feeding be employed to save the affected animals.

Dr. O. T. Hart, of Norris City, Ill., is opening offices at St. Joseph, Illinois.



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HEALTH CERTIFICATES FOR AUCTION CATTLE

At a joint meeting of the Washington and Oregon veterinary medical associations recently held in Portland, resolutions were adopted favoring the enactment of laws in the states of Washington, Montana, and Idaho, similar to those existing in the state of Oregon, requiring the tubercular testing and inspection of dairy and breeding cattle and other cattle coming in contact with such cattle, as at public sales, etc., such inspection and testing to be done under the supervision of a live stock sanitary board or similar organization and through a county or district dairy herd inspector, who is a graduate veterinarian.

Another resolution was adopted favoring, for the time being, as a war measure, the handling and treatment of live stock diseases and their prevention by county agents, but that in the future the secretary of agriculture direct that the control and educational work in veterinary science be conducted by the United States bureau of animal industry and the state live stock sanitary boards and similar organizations, and that the states relation service and extension departments direct their educational work to lines embodying purely agricultural and horticultural subjects, and the live stock sanitary activities of county agents be confined to live stock disease, survey work and the reporting of diseases.

HOGS WHERE HOGS NEVER GREW BEFORE

Until four years ago not a single carload of hogs was shipped from 17 counties in southern Alabama. In the year that ended April 1, 1918, the carloads of hogs shipped from the same 17 counties numbered 2,352 at an estimated value of more than $4,000,000.

Dr. F. C. Kochendorfer, class of '18, Chicago Veterinary College, has located at Decorah, Iowa.

That oak-leaf poisoning caused the death of a number of cattle recently in Burro Creek and Dallas Counties, Colo., is the verdict of state veterinarian Lamb, who was called to investigate the matter.

That a new form of sabotage is being practiced in Iowa, is evidenced by the breaking out of cholera on nine widely separated farms in northwest Adair county, resulting in the quarantine of four townships. Investigation shows that nine farmers found strange pigs in their herds, and in each instance the pigs were an entirely different breed from those in the neighborhood, and soon thereafter disease broke out in the herds.

Position of the left hand when inspecting the mouth. Physicking or Balling.

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Its Application It is applied as easily as a bit (see illustration), without assistance and without frightening or hurting the animal. Experts pronounce it the most perfect instrument made for the examination and treatment of the mouth and teeth, physicking and balling.

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Size for Swine, Sheep, Dogs	1.50
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LAMBS PROFITABLE

On July 23d Fred Gooding of Shoshone, Idaho, sold in Chicago, 1,376 lambs, averaging 72 pounds, at $19.25 per cwt. They were shipped in five double-decked cars. The total receipts were $18,823, or over $3,700 per carload. The average per head was $13.86.

On the same day in Omaha, Andrew Little, of Emmett, Idaho, sold 1,920 lambs, weighing 76 pounds each, at $18.25 per cwt. The entire bunch brought $27,265, or an average of $13.87 per head.

AUSTRALIA'S SHEEP PRICES

The average price paid for good ewes in Australia this year ranges from $6 to $10. The price per head in Argentine is slightly higher, and in these two great wool-producing countries, the sheep industry is experiencing wonderful prosperity.

BIG WOOL CLIPS

Lee Simonsen will ship about 333,000 pounds of wool from Wyoming, while J. B. Long & Co. will have sheared something like 325,000 pounds from their Montana flocks.

AVERAGE PRICE OF WESTERN WOOL

Government appraisements are just returning to the growers and averages from 50 to 70 cents per pound, an average of 60 cents being general.

PIONEER VETERINARIAN DIES

It is with regret that we announce the death of Dr. W. B. Rowland of Pasadena, Cal., assistant state veterinarian for the past ten years. Dr. Rowland was in his sixtieth year; was born in Media, Pa.; and studied under the late Dr. Liautard. He began practice at Wilmington, Del., where he built up a large practice, having charge of all the horses belonging to the Du Pont Powder company.

In 1888, he located at Pasadena, Cal., and continued in practice until his appointment as assistant state veterinarian. A number of years ago, during an epidemic of glanders which swept over the state of California Dr. Rowland became infected in his arm, and came near dying from the effects of the poison in his system, and suffered from the effects of it the remainder of his life.

DOURINE AMONG RANGE HORSES

Measures are being taken to prevent the further spread of dourine among horses on the National forests. The U. S. Forest Service is co-operating with the U. S. Bureau of Animal Industry to eradicate the disease.

A round-up of all the wild horses on the affected areas was attempted last year, but, as many of the horses are wild, only partial success was attained.

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FOR SALE—Anti-Fis-Tract has been proven a reliable remedy for all fistulous tracts, actinomycosis, etc. Full directions. $1.00 per dozen. Charges prepaid. I. G. Wimsett, D. V. M., Winfield, Kansas.

FOR SALE—Select cat and dog practice for sale. Complete hospital equipment; well-equipped laboratory; instruments, etc., cheap rent, long lease. If you are looking for the best opportunity possible do not overlook this. Will offer my services to the government if I can dispose of my practice. Unless you have $3,000 cash or bankable paper, do not answer. Dr. Allen A. Foster, Dallas, Texas.

FOR SALE—Good veterinary practice in Southern Pennsylvania. Terms reasonable. Location excellent. Address, Dr. L. C. Wambaugh, Red Lion, Pa.

MISCELLANEOUS

WANTED—Position by graduate veterinarian with ten years' experience, as assistant to veterinarian with large practice. City or large town preferred. Address No. 380, Care Veterinary Medicine.

WANTED—Position by senior student as assistant to practitioner. Country practice preferred. Abe Shum, Gladstone, Ill.

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Then we have recently got out another we call **our Fashion book**, wholly devoted to fashion plates of muffs, neckwear and other fine fur garments, with prices; also **fur garments remodeled and repaired.**

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Dr. L. A. Maze has severed his connection with Parke, Davis & Co. as assistant veterinarian at their biological farm at Rochester, Mich., and has purchased the practice of Dr. C. E. Parker, of Pontiac, Mich., who is now in service at Ft. Oglethorpe, Ga.

STOCK BRAND BOOK

After months of effort by a corps of workers, a directory and brand book for the stock men of Oregon, is ready for distribution. The work of compiling was done under the auspices of the Oregon Stock Growers' Association in co-operation with state veterinarian Dr. W. H. Lytle, the state records being the basis of the information. In addition to the record of some 7,000 brands, with names and addresses of the owners, the book contains valuable stock statistics and authoritative articles on cattle diseases, making an exceptionally useful book, filling an almost daily need among stock men of the state. The extent of the work may be judged from the fact that it sells for $5.00 a copy.

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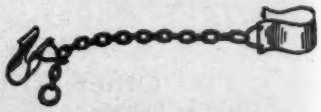

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PRO-GERMAN BOYCOTT SCHEME

We note in a recent issue of the *Free Press*, Mankato, Minn., that Dr. B. J. Lattimer, of Springfield, Minn., was recently the object of a boycott scheme, because of his opposition to pro-Germanism, which made him persona non grata to certain farmers and a few townspeople who sought to put him out of business by circulating a paper pledging their support to a man they induced to come to practice there, whose political views suited them better. The paper contained forty-three signatures, when the government got wind of it and took a hand in the game. The matter is under investigation. Several cases of disloyalty were unearthed and some damaging affidavits obtained, and it is likely some of the instigators will face serious charges.

RECENT PUBLICATIONS

Notes In Regard to Bots, Gastrophilus Species

By Maurice C. Hall, Ph.D., D.V.M.

Leaflet, Research Laboratory, Parke, Davis & Co., Detroit, Mich.

The results of a series of experiments to test the efficacy of carbon bisulphide in expelling bots from horses are reported. Post-mortem tests following experimental test shows it to be highly effective. Neither chloroform nor oil of chenopodium proved of any value in removing bots, in these experiments.

The author concludes, "Roubaud's investigations indicate that the bot larva escapes from the egg when the horse bites or rubs his skin with his mouth and burrows into the buccal mucosa before proceeding to the stomach."

Four Essential Factors in the Production of Milk of Low Bacterial Content

By S. Henry Ayres, Lee B. Cook and Paul W. Clemmer.

Bulletin No. 642, U. S. Department of Agriculture, Washington, D. C.

The production of milk of a high sanitary quality involves a knowledge of the influence of various factors. To deal intelligently with the question the following four factors are considered essential for clarifying the subject:

1. Factors concerned in the production of milk which is practically free from visible dirt and which has a low bacterial content.
2. Facts most directly concerned in the prevention of infection of milk with pathogenic organisms.
3. Factors of importance in connection with the handling of cattle.
4. Factors concerned in providing and maintaining conditions suitable for the production of a food product, even though they may not directly affect the quality of the product.

The three essential factors which most influence the bacterial content are: (1) the use of sterilized vessels; (2) clean cows, especially the udders and teat; (3) the use of the small-top pail.

Extensive experiments carried out in a specially constructed barn indicate that it is possible for the average dairyman on the average farm, without expensive barns and equipment, to produce milk which when fresh has a low bacterial count. The necessity of keeping milk as near 10° C. as possible is emphasized. The bulletin is quite extensive, covering some sixty-three pages. Numerous citations from the literature are appended.

CORNELL UNIVERSITY YEAR BOOK

The announcements contained in the Year Book of the New York State Veterinary College at Cornell for 1918-19 indicate that there will be no let up in the activities of the veterinary department of the school. The course as presented includes all that could be desired and the staff comprises some of the most eminent men in the profession. The equipment and facilities as set forth in the announcement are of the best, and it is pointed out that the opportunities for investigation and research are exceptionally great, and graduate and advanced students are afforded ample means for carrying on independent investigations.

Manure Disposal as a Factor in the Control of Parasitic Diseases of Live Stock

By Maurice C. Hall

Leaflet 133, Parke, Davis & Co., Detroit, Mich.

This leaflet contains some exceedingly practical suggestions relative to the disposal of manure as a control measure for a large number of important parasites which infest live stock and domestic animals. Two lines of attack are apparent: (1) treating the manure so as to kill the eggs and larvae; (2) placing the manure where it would have little or no capacity for infecting stock. It is also noted that the same measures will serve as aids in controlling some of the bacterial diseases.

Dehorning and Castrating Cattle

By Frank W. Farley.

Farmers' Bulletin No. 919, United States Department of Agriculture, Washington, D. C.

The bulletin disclaims all pretensions of being a treatise on the subject, its aim being to present certain facts and explain

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methods of dehorning and castration so that they may be clearly understood by cattle owners. The bulletin contains descriptions for building a dehorning chute, various suggestions as to care and treatment of animals, time for castrating and dehorning and other matters pertaining to the subject.

Procedimientos de diferenciacion de las carnes (Methods of Differentiating Meats), by Drs. Lopez and Armandaritz, provincial veterinary inspectors of Barcelona and Lugo, Spain. This pamphlet furnishes a manual for determining the different classes of meats and is especially valuable for meat inspectors. The subject is treated under four general headings: physical methods, chemical methods, anatomical and biologic. The subject is covered thoroughly in a practical way.

N. S. M.

Garantias generales de preparacion y presentacion que deben exigir los Veterinarios a los Laboratorios de Sueros y Vacunas, y especiales para el suero contra el colera o peste de cerdo (Guarantees that should be required by veterinarians of laboratories that supply serums and vaccines, particularly anti-hog cholera serum), by Dr. C. Lopez.

This pamphlet comprises a discussion of the conditions and measures that should be taken by laboratories for the production, testing, and distribution of serums and vaccines in order to insure their efficiency and to prevent contamination.

N. S. M.

Diagnostico de la prenez en las vacas (Diagnosing Pregnancy in Cows), by Dr. C. Lopez. Diagnosis and treatment of avian diphtheria and chicken-pox.

A general but complete discussion of these subjects.

N. S. M.

WAR EMERGENCIES

War emergencies are causing numerous changes in ownership. Many such transactions are being arranged through the aid of our "Classified Department," to the satisfaction of both parties. Rates, 5 cts. per word. Minimum charge $1.00. Copy should be in our hands by the 10th.

At the meeting of the Texas State Veterinary Association at Waco, in August, Waco was selected as the permanent meeting place of the Association. The following officers were elected: President, Dr. J. M. Miller, Waco; vice presidents, Dr. George Griffiths, Rosenthal; Dr. E. A. Mayberry, Mounds; secretary-treasurer, Dr. F. R. Wingrove, McGregor.

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